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     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
     LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002
L1          6113 S PHOSPHORYLASE (A) KINASE?
L2       1826592 S CALCIUM OR CALMODULIN
L3          1863 S L1 AND L2
L4       5404408 S CLON? OR EXPRESS? OR RECOMBINANT
L5           194 S L3 AND L4
L6       3195886 S PLANT? OR SEED?
L7        178637 S RICE OR ARYZA(A)SATIVA
L8             1 S L5 AND L7
L9             1 S L1 AND L7
                 E ALLEN S M/AU
L10          285 S E3
                 E LEE J M/AU
L11         2739 S E3
L12         3022 S L10 OR L11
L13            0 S L1 AND L12
L14           18 S L7 AND L12
L15           17 DUP REM L14 (1 DUPLICATE REMOVED)
L16       969695 S KINASE?
L17            2 S L15 AND L16
L18            0 S L3 AND L12
L19           56 S L2 AND L12
L20            3 S L19 AND L16
L21            5 S "CALCIUM DEPENDENT PHOSPHORYLASE KINASE?"
L22            1 S L21 AND L7
L23            1 S L1 AND L7
L24            1 S L21 AND L6
L25      1725731 S SUBSTRATE? OR GLYCOGEN(A)PHOSPHORYLASE?
L26         1900 S L25 AND L1
L27            1 S L7 AND L26
L28         1789 S "CALCIUM DEPENDENT PROTEIN KINASE?"
L29           13 S L1 AND L28
L30           11 DUP REM L29 (2 DUPLICATES REMOVED)
L31         1745 S (L28 OR L1) AND SUBSTRATE?
L32          491 S L28 AND SUBSTRATE?
L33         1259 S L1 AND SUBSTRATE?
L34          203 S L32 AND PLANT?
L35           16 S L33 AND PLANT?
L36            9 DUP REM L35 (7 DUPLICATES REMOVED)
L37            1 S L36 AND L28
L38            5 S L32 AND L33
L39           13 S L1 AND L28
L40           11 DUP REM L39 (2 DUPLICATES REMOVED)
L41          210 S  L1 AND HOMOLOG?
L42           92 S L41 AND STRUCTUR?
L43           41 DUP REM L42 (51 DUPLICATES REMOVED)
L44           27 S L43 AND SUBUNIT?

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L37            1 S L36 AND L28
L38            5 S L32 AND L33
L39           13 S L1 AND L28
L40           11 DUP REM L39 (2 DUPLICATES REMOVED)

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LOGINID:SSSPTA1652MXM

PASSWORD:
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NTIS, LIFESCI' AT 15:12:33 ON 07 MAY 2002
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L22            1 S L21 AND L7
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L23           1 S L1 AND L7
L24           1 S L21 AND L6

=> s substrate? or glycogen(a)phosphorylase?
L25    1725731 SUBSTRATE? OR GLYCOGEN(A) PHOSPHORYLASE?

=> s l25 and l1
L26       1900 L25 AND L1

=> s l7 and l26
L27          1 L7 AND L26

=> s "calcium dependent protein kinase?"
   2 FILES SEARCHED...
L28       1789 "CALCIUM DEPENDENT PROTEIN KINASE?"

=> d his

     (FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

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L28        1789 S "CALCIUM DEPENDENT PROTEIN KINASE?"

=> s l1 and l28
L29          13 L1 AND L28

=> dup rem l29
PROCESSING COMPLETED FOR L29
L30          11 DUP REM L29 (2 DUPLICATES REMOVED)

=> d 1-11 ibib ab
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L30 ANSWER 1 OF 11 SCISEARCH COPYRIGHT 2002 ISI (R)
ACCESSION NUMBER: 1999:561209 SCISEARCH
THE GENUINE ARTICLE: 216HW
TITLE: Autophosphorylation-dependent activation of a **calcium-dependent protein kinase** from groundnut
AUTHOR: Chaudhuri S; Seal A; DasGupta M (Reprint)
CORPORATE SOURCE: UNIV CALCUTTA, BALLYGUNGE SCI COLL, DEPT BIOCHEM, 35 BALLYGUNGE CIRCULAR RD, CALCUTTA 700019, W BENGAL, INDIA (Reprint); UNIV CALCUTTA, BALLYGUNGE SCI COLL, DEPT BIOCHEM, CALCUTTA 700019, W BENGAL, INDIA
COUNTRY OF AUTHOR: INDIA
SOURCE: PLANT PHYSIOLOGY, (JUL 1999) Vol. 120, No. 3, pp. 859-866. Publisher: AMER SOC PLANT PHYSIOLOGISTS, 15501 MONONA DRIVE, ROCKVILLE, MD 20855.
ISSN: 0032-0889.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: English
REFERENCE COUNT: 28

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Ca2+-dependent protein kinases (CDPKs) containing a calmodulin-like domain integrated in their primary sequence are present primarily in plants. A member of this family was characterized from the groundnut (Arachis hypogea) plant and called GnCDPK (M. DasGupta [1994] Plant Physiol 104: 961-969). GnCDPK specifically uses the myosin light chain synthetic peptide (MLCpep), which is the phosphate-accepting domain of smooth muscle myosin light chains (KKRPQRATSNVFS), as an exogenous substrate under in vitro experimental conditions. In this report we show that GnCDPK undergoes intramolecular autophosphorylation. This self-phosphorylation occurs in threonine residues in a Ca2+-dependent (K-0.5 = 0.5 mu M) and calmodulin-independent manner. The kinase activity toward MLCpep and its sensitivity to Ca2+ were unaffected by prior autophosphorylation when measured under saturating ATP concentrations. The role of autophosphorylation in the exogenous substrate MLCpep phosphorylation reaction was reinvestigated at low ATP concentrations. A pronounced lag time of 1 to 2 min, followed by a linear increase of activity for 7.5 min, was seen in the initial rate of MLCpep phosphorylation under such suboptimal conditions. Prior autophosphorylation completely abolished this lag phase, and a sharp rise of exogenous substrate phosphorylation was seen from the 1st min. Our results suggest that autophosphorylation is a prerequisite for the activation of GnCDPK.

L30 ANSWER 2 OF 11 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 1
ACCESSION NUMBER: 1991:205588 BIOSIS
DOCUMENT NUMBER: BA91:108813
TITLE: **PHOSPHORYLASE KINASE** FROM BOVINE STOMACH SMOOTH MUSCLE A **CALCIUM-DEPENDENT PROTEIN KINASE** ASSOCIATED WITH AN ACTIN-LIKE MOLECULE.
AUTHOR(S): ZEVGOLIS V G; SOTIROUDIS T G; EVANGELOPOULOS A E
CORPORATE SOURCE: INST. BIOL. RES., NATL. HELLENIC RES. FOUND., 48 VASSILEOS CONSTANTINOU AVE., ATHENS 16 35, GREECE.
SOURCE: BIOCHIM BIOPHYS ACTA, (1991) 1091 (2), 222-230.
CODEN: BBACAQ. ISSN: 0006-3002.
FILE SEGMENT: BA; OLD
LANGUAGE: English

AB **Phosphorylase kinase** was purified (110-fold) from bovine stomach smooth muscle by a procedure involving DEAE-cellulose chromatography, ammonium sulfate fractionation and glycerol density

ultracentrifugation. On sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) the final enzyme preparation shows a single protein band of 43 kDa. The purified protein exhibits a close similarity with bovine aortic actin, as revealed by amino acid analysis and sequencing of a tryptic decapeptide fragment, although it differs widely from actin in several respects. In our effort to separate **phosphorylase kinase** activity from the 43 kDa protein we used a variety of chromatographic procedures, but in all cases the catalytic activity (when eluted) was accompanied by the 43 kDa protein band. Bovine stomach **phosphorylase kinase** exhibits an apparent molecular mass of 950 kDa, it shows a low Vmax value for phosphorylase b (85 nmol .cntdot. min-1 .cntdot. mg-1), a pH 6.8/8.2 activity ratio of 0.23, it has an absolute requirement for Ca2+ and it is activated 1.8-fold by Ca2+/calmodulin. Furthermore, the protein kinase activity is neither inhibited by antibodies against rabbit skeletal muscle **phosphorylase kinase** nor activated by protein phosphorylation. These results suggest that bovine stomach **phosphorylase kinase** is tightly bound to an aggregate of actin-like molecules.

L30 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1986:47453 HCAPLUS
DOCUMENT NUMBER: 104:47453
TITLE: **Calcium-dependent protein kinases** and calmodulin antagonists
AUTHOR(S): Hofmann, Franz
CORPORATE SOURCE: Pharmakol. Inst., Univ. Heidelberg, Heidelberg, 6900, Fed. Rep. Ger.
SOURCE: Calmodulin Antagonists Cell. Physiol. (1985), 287-98. Editor(s): Hidaka, Hiroyoshi; Hartshorne, David J. Academic: Orlando, Fla. CODEN: 54VBAV
DOCUMENT TYPE: Conference; General Review
LANGUAGE: English
AB A review, with 77 refs., of calmodulin-Ca-dependent protein kinases (myosin light- and heavy-chain kinases, membrane-bound protein kinases, multifunctional protein kinases, and **phosphorylase kinase**) and Ca-phospholipid-dependent protein kinase and their inhibition by calmodulin antagonists.

L30 ANSWER 4 OF 11 MEDLINE
ACCESSION NUMBER: 85023304 MEDLINE
DOCUMENT NUMBER: 85023304 PubMed ID: 6541504
TITLE: Homology of the gamma subunit of phosphorylase b kinase with cAMP-dependent protein kinase.
AUTHOR: Reimann E M; Titani K; Ericsson L H; Wade R D; Fischer E H; Walsh K A
CONTRACT NUMBER: AM 07902 (NIADDK)
AM 19231 (NIADDK)
GM 15731 (NIGMS)
+
SOURCE: BIOCHEMISTRY, (1984 Aug 28) 23 (18) 4185-92. Journal code: A0G; 0370623. ISSN: 0006-2960.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 198412
ENTRY DATE: Entered STN: 19900320
Last Updated on STN: 19970203
Entered Medline: 19841212
AB The complete amino acid sequence of the catalytic subunit (gamma subunit)

of rabbit skeletal muscle phosphorylase b kinase was determined. The gamma subunit was purified by gel filtration in acidic 8 M urea after reduction and S-carboxymethylation in 7 M guanidine hydrochloride. Cleavage of the gamma subunit at arginyl bonds gave a complete set of nonoverlapping peptides. Overlapping peptides were obtained by cleavage at methionyl, tryptophanyl, or glutamyl bonds and by selected subdigestion of two large peptides obtained by cleavage at methionyl bonds. Sequence analysis established that the protein contains 386 residues corresponding to a molecular weight (Mr) of 44673. Comparison of the gamma subunit with the catalytic subunit of bovine cAMP-dependent protein kinase and with tyrosine-specific kinases of viral origin revealed a significant degree of sequence identity among all of these proteins. These data suggest that **calcium-dependent protein kinases** may share a common ancestral gene and a common structural basis for catalytic function with a wide variety of other protein kinases which respond to different signals and control quite different processes.

L30 ANSWER 5 OF 11 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 2

ACCESSION NUMBER: 1985:220395 BIOSIS
DOCUMENT NUMBER: BA79:391
TITLE: **CALCIUM-DEPENDENT PROTEIN KINASE** INJECTION IN A PHOTORECEPTOR MIMICS BIOPHYSICAL EFFECTS OF ASSOCIATIVE LEARNING.
AUTHOR(S): ACOSTA-URQUIDI J; ALKON D L; NEARY J T
CORPORATE SOURCE: SECT. NEURAL SYSTEMS, LAB. BIOPHYSICS, NATL. INST. HEALTH, MARINE BIOL. LAB., WOODS HOLE, MASS. 02543.
SOURCE: SCIENCE (WASH D C), (1984) 224 (4654), 1254-1257. CODEN: SCIEAS. ISSN: 0036-8075.
FILE SEGMENT: BA; OLD
LANGUAGE: English

AB Iontophoretic injection of **phosphorylase kinase**, a Ca2+-calmodulin-dependent protein kinase, increased input resistance, enhanced the long-lasting depolarization component of the light responses and reduced the early transient outward K+ current, IA and the late K+ currents, IB, in type B photoreceptors of Hermissenda crassicornis in a Ca2+-dependent manner. Since behavioral and biophysical studies have shown that similar membrane changes persist after associative conditioning, Ca2+-dependent protein phosphorylation could mediate the long-term modulation of specific K+ channels as a step in the generation of a conditioned behavioral change.

L30 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1984:437040 HCAPLUS
DOCUMENT NUMBER: 101:37040
TITLE: Generation, characterization and ELISA of monospecific antibodies against the subunits of a **calcium -dependent protein kinase** and a calcium-transport ATPase from rabbit skeletal muscle
AUTHOR(S): Boehm, Hannelore; Petersen-Von Gehr, Joerg K. H.; Neubauer, Horst P.; Jennissen, Herbert P.
CORPORATE SOURCE: Inst. Physiol., Physiol. Chem. Ernaehrungsphysiol., Ludwig-Maximilians-Univ., Munich, Fed. Rep. Ger.
SOURCE: J. Immunol. Methods (1984), 70(2), 193-209 CODEN: JIMMBG; ISSN: 0022-1759
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Monospecific pptg. sheep antibodies were generated for the first time against the purified, homogeneous .alpha.-, .beta.-, and .gamma.-subunits of the Ca2+-dependent protein **kinase, phosphorylase kinase**, from rabbit muscle. As ref., antibodies against the

holoenzyme and the Ca2+-transport ATPase of sarcoplasmic reticulum were induced. In all cases antibody titers could be quantitated by ELISA. Differentiation of antibody binding was achieved by quant. pptn. and complement fixation assays. In general, maximal antibody titers were reached 56 days after primary immunization and high titers (.apprx.5000) were maintained for several weeks. Anti-.alpha., anti-.beta., and anti-.gamma. avidly ppt. the denatured subunits employed as immunogens as well as the native enzyme. No cross-reactivity between antibodies against a specific subunit and any of the other heterologous subunits was demonstrable in double immunodiffusion assays providing no evidence for immunol. identical sites on the .alpha.-, .beta.-, and .gamma.-subunits. Since anti-.alpha., anti-.beta., and anti-.gamma. strongly inhibit enzyme activity, it is likely that they do so primarily by sterically interfering with the binding of the large substrate phosphorylase b to **phosphorylase kinase**. It cannot be excluded, however, that anti-.beta. and anti-.gamma. bind to the active sites on these 2 subunits.

L30 ANSWER 7 OF 11 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1983:229880 BIOSIS
DOCUMENT NUMBER: BA75:79880
TITLE: PHOSPHO LIPID SENSITIVE **CALCIUM DEPENDENT PROTEIN KINASE** FROM HEART 2. SUBSTRATE SPECIFICITY AND INHIBITION BY VARIOUS AGENTS.
AUTHOR(S): WISE B C; GLASS D B; CHOU C-H J; RAYNOR R L; KATOH N; SCHATZMAN R C; TURNER R S; KIBLER R F; KUO J F
CORPORATE SOURCE: DEP. NEUROL., EMORY UNIV. SCH. MED., ATLANTA, GEORGIA 30322.
SOURCE: J BIOL CHEM, (1982) 257 (14), 8489-8495.
CODEN: JBCHA3. ISSN: 0021-9258.
FILE SEGMENT: BA; OLD
LANGUAGE: English

AB The specificity of substrates (including both phosphate donors and acceptors) for phospholipid-sensitive Ca2+-dependent protein kinase purified (80-95% homogeneous) from bovine heart and inhibition of its activity by various agents were investigated. The apparent Km for ATP, using histone H1 as substrate, of the enzyme was 4.4 .mu.M. Phosphorylation by ATP was inhibited most markedly by .alpha.,.beta.-methylene ATP and, to a lesser extent, by adenosine 5'-O-(thiotriphosphate), 2'-deoxy ATP, and .beta.,.gamma.-methylene ATP. The enzyme was able to utilize adenosine 5'-O-(thiotriphosphate) to thiophosphorylate histone H1. Among histone subfractions, peptides and proteins examined, histone H1 (apparent Km = 0.6 .mu.M; Vmax = 0.83 .mu.mol/min per mg of enzyme) and myelin basic protein (apparent Km = 0.3-.mu.M) were the best substrates for the enzyme. The enzyme partially purified from rat brain and pig spleen also effectively phosphorylated myelin basic protein, with apparent Km values of 0.5 and 0.8 .mu.M, respectively. Exhaustive phosphorylation of histone H1 and myelin basic protein indicated the numbers of moles of phosphate incorporated per mol of the 2 substrates to be 2 and 5, respectively. Oligopeptides containing the amino acid sequences around serine 32 and serine 36 in histone H2B, like histone H2B itself, were relatively ineffective as substrates. A heptapeptide containing the amino acid sequence around the serine phosphorylation site in pyruvate kinase, pyruvate kinase itself, **phosphorylase kinase**, myosin light chain, protamine and phosvitin were practically ineffective. The enzyme was inhibited to various degrees by a number of agents, including palmitoylcarnitine, adriamycin, trifluoperazine, polymyxin B,N-(6-aminohexyl)-5-chloro-1-naphthalensulfonamide, heparin and polyamines. Phospholipid-sensitive Ca2+-dependent protein kinase had a protein substrate specificity distinguishable from that previously reported for cyclic nucleotide-dependent protein kinases and the calmodulin-sensitive species

of Ca2+-dependent protein kinases, such as myosin light chain kinase, and trifluoperazine and N-(6-aminohexyl)-5-chloro-1-naphthalenesulfonamide cannot be considered as selective inhibitors of calmodulin/Ca2+-stimulated enzymes as commonly suggested.

L30 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1981:79321 HCAPLUS
DOCUMENT NUMBER: 94:79321
TITLE: Studies on calcium(2+) ion-activated, phospholipid-dependent protein kinase; isolation and characterization of a catalytically active fragment
AUTHOR(S): Kishimoto, Akira
CORPORATE SOURCE: Sch. Med., Kobe Univ., Japan
SOURCE: Kobe J. Med. Sci. (1981), 26(3), 183-206
CODEN: KJMDA6; ISSN: 0023-2513
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Limited proteolysis of purified rat brain Ca2+-activated phospholipid-dependent protein kinase (protein kinase C) with Ca2+-dependent mammalian neutral protease resulted in the formation of a catalytically active fragment with a mol. wt. of .apprx.5.1 .times. 104. This fragment was fully active without Ca2+ and phospholipid, indicating that the active site is not located in the phospholipid-binding domain. It did exhibit, however, an abs. requirement for Mg2+ or Mn2+, and also required a thiol, such as mercaptoethanol, glutathione, or cysteine, for activity. It was independent of cyclic nucleotides and had properties differing from those of the catalytic subunit of cGMP- and cAMP-dependent protein kinases. However, it phosphorylated the same specific serine residues in H1 and H2B histones as does cAMP-dependent protein kinase and also phosphorylated muscle **phosphorylase kinase** and glycogen synthase. Thus, protein kinase C possesses similar pleiotropic catalytic activities as those previously described for cAMP-dependent protein kinase. Possible physiol. functions of the proteolytic activation of protein kinase C are discussed.

L30 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1978:593046 HCAPLUS
DOCUMENT NUMBER: 89:193046
TITLE: The role of **calcium dependent protein kinases** in the regulation of muscle glycogen metabolism
AUTHOR(S): Heilmeyer, Ludwig M. G., Jr.; Varsanyi, Magdolna; Groeschel-Stewart, Ute; Kilimann, Manfred; Djovkar, Assadollah; Hoerl, Walter H.; Jennissen, Herbert P.; Dickneite, Gerhard
CORPORATE SOURCE: Inst. Physiol. Chem., Ruhr-Univ., Bochum, Ger.
SOURCE: Proc. FEBS Meet. (1978), Volume Date 1977, 42(Regul. Mech. Carbohydr. Metab.), 119-27
CODEN: FEBPBY; ISSN: 0071-4402
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Muscle **phosphorylase kinase** (nonphosphorylated form) is activated by Ca2+. This reaction was modulated by Mg2+; at low Mg2+ concns. the enzyme exhibited a basal activity, and at higher Mg2+ concns. an addnl. activity was induced. The basal activity was correlated with satn. of 1 type of binding site (n1) with Ca2+, whereas the satn. of the Mg2+-induced binding site (n4) apparently caused the Mg2+-induced higher activity. A Ca2+-dependent protein kinase was localized in rabbit muscle membranes which accepts phosphorylase b as substrate. Antiphosphorylase kinase inhibited Ca2+-ATPase of sarcoplasmic reticulum in the absence or presence of oxalate. Stimulation of ATPase with oxalate was correlated with the inhibition of a protein phosphatase. Hydroxylamine inhibited

phosphorylase kinase and ATPase activities simultaneously. Basal ATPase activity was not influenced by **phosphorylase kinase** or protein phosphatase, but Ca2+-stimulated activity was inhibited .apprx.90% by the phosphatase and this inhibition was specifically reversed by **phosphorylase kinase**.

L30 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1977:579763 HCAPLUS
DOCUMENT NUMBER: 87:179763
TITLE: Studies on a cyclic nucleotide-independent protein kinase and its proenzyme in mammalian tissues. II. Proenzyme and its activation by calcium-dependent protease from rat brain
AUTHOR(S): Inoue, Masanori; Kishimoto, Akira; Takai, Yoshimi; Nishizuka, Yasutomi
CORPORATE SOURCE: Dep. Biochem., Kobe Univ. Sch. Med., Kobe, Japan
SOURCE: J. Biol. Chem. (1977), 252(21), 7610-16
CODEN: JBCHA3
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A proenzyme (I) of bovine cerebellum protein kinase (II) was found in the sol. fraction of rat brain. Upon limited proteolysis by Ca2+-dependent protease (III) occurring in the same tissue, I was converted to an active I which could phosphorylate 5 species of histone fractions. Trypsin also catalyzed the conversion. I and III were sepd. by DEAE-cellulose column chromatog. By this procedure I was resolved into 2 components; each was purified further by gel filtration followed by isoelectrofocusing electrophoresis. Both components showed a sedimentation coeff. of .apprx.5.1 with a mol. wt. of 7.7 .times. 104 and a Stokes radius of .apprx.42 .ANG.. Upon isoelectrofocusing electrophoresis, I exhibited heterogeneity with isoelec. points of 4.0-5.6. I showed no gycogen **phosphorylase kinase** activity but was always assocd. with activity to phosphorylate protamine. III was also purified further by gel filtration followed by DEAE-cellulose column chromatog. III showed a sedimentation coeff. of .apprx.5.8 with a mol. wt. of 9.3 .times. 104, a Stokes radius of .apprx.47 .ANG., and an isoelec. point of 4.8. III required a divalent cation almost absolutely; Ca2+ was most active and the max. activity was obtained at 3 mM. Sr2+ and Mn2+ were 24% and 11% as active as Ca2+, resp., but other cations including Mg2+, Ba2+, Zn2+, and Cu2+ were inactive. The optimum pH of III was 7.5-8.5. Active II thus produced from I in vitro showed a sedimentation coeff. of .apprx.3.9 with a mol. wt. of 5.1 .times. 104 and a Stokes radius of .apprx.38 .ANG.. Although these values were slightly different from those of II which was obtained from bovine cerebellum stored frozen, the active II enzymes were indistinguishable from each other in their kinetic and catalytic properties. A preliminary survey revealed that I and II were distributed in many other tissues, including lung, liver, kidney, cerebellum, heart, skeletal muscle, and adipose tissue.

L30 ANSWER 11 OF 11 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1975:93784 BIOSIS
DOCUMENT NUMBER: BR11:93784
TITLE: EVIDENCE FOR THE PRESENCE OF A **CALCIUM DEPENDENT PROTEIN KINASE PHOSPHORYLASE KINASE** EC-2.7.1.37 IN SARCOPLASMIC RETICULUM MEMBRANES.
AUTHOR(S): HOERL W H; JENNISSEN H P; GROESCHEL-STEWART U; HEILMEYER L M G JR
SOURCE: Hoppe-Seyler's Z. Physiol. Chem., (1975) 356 (3), 239.
CODEN: HSZPAZ. ISSN: 0018-4888.
DOCUMENT TYPE: Conference

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FILE SEGMENT:       BR; OLD
LANGUAGE:           Unavailable


=> d his

     (FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
     LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002
L1          6113 S PHOSPHORYLASE (A)KINASE?
L2       1826592 S CALCIUM OR CALMODULIN
L3          1863 S L1 AND L2
L4       5404408 S CLON? OR EXPRESS? OR RECOMBINANT
L5           194 S L3 AND L4
L6       3195886 S PLANT? OR SEED?
L7        178637 S RICE OR ARYZA(A)SATIVA
L8             1 S L5 AND L7
L9             1 S L1 AND L7
                 E ALLEN S M/AU
L10          285 S E3
                 E LEE J M/AU
L11         2739 S E3
L12         3022 S L10 OR L11
L13            0 S L1 AND L12
L14           18 S L7 AND L12
L15           17 DUP REM L14 (1 DUPLICATE REMOVED)
L16       969695 S KINASE?
L17            2 S L15 AND L16
L18            0 S L3 AND L12
L19           56 S L2 AND L12
L20            3 S L19 AND L16
L21            5 S "CALCIUM DEPENDENT PHOSPHORYLASE KINASE?"
L22            1 S L21 AND L7
L23            1 S L1 AND L7
L24            1 S L21 AND L6
L25      1725731 S SUBSTRATE? OR GLYCOGEN(A)PHOSPHORYLASE?
L26         1900 S L25 AND L1
L27            1 S L7 AND L26
L28         1789 S "CALCIUM DEPENDENT PROTEIN KINASE?"
L29           13 S L1 AND L28
L30           11 DUP REM L29 (2 DUPLICATES REMOVED)

=> s (l28 or l1) and substrate?
L31        1745 (L28 OR L1) AND SUBSTRATE?

=> s l28 and substrate?
L32         491 L28 AND SUBSTRATE?

=> s l1 and substrate?
L33        1259 L1 AND SUBSTRATE?

=> s l32 and plant?
L34         203 L32 AND PLANT?

=> s l33 and plant?
L35          16 L33 AND PLANT?

=> dup rem l35
PROCESSING COMPLETED FOR L35
L36            9 DUP REM L35 (7 DUPLICATES REMOVED)
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=> d 1-9 ibib ab

L36 ANSWER 1 OF 9 SCISEARCH COPYRIGHT 2002 ISI (R)
ACCESSION NUMBER: 1999:561209 SCISEARCH
THE GENUINE ARTICLE: 216HW
TITLE: Autophosphorylation-dependent activation of a calcium-dependent protein kinase from groundnut
AUTHOR: Chaudhuri S; Seal A; DasGupta M (Reprint)
CORPORATE SOURCE: UNIV CALCUTTA, BALLYGUNGE SCI COLL, DEPT BIOCHEM, 35 BALLYGUNGE CIRCULAR RD, CALCUTTA 700019, W BENGAL, INDIA (Reprint); UNIV CALCUTTA, BALLYGUNGE SCI COLL, DEPT BIOCHEM, CALCUTTA 700019, W BENGAL, INDIA
COUNTRY OF AUTHOR: INDIA
SOURCE: PLANT PHYSIOLOGY, (JUL 1999) Vol. 120, No. 3, pp. 859-866. Publisher: AMER SOC PLANT PHYSIOLOGISTS, 15501 MONONA DRIVE, ROCKVILLE, MD 20855.
ISSN: 0032-0889.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: English
REFERENCE COUNT: 28

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Ca2+-dependent protein kinases (CDPKs) containing a calmodulin-like domain integrated in their primary sequence are present primarily in **plants**. A member of this family was characterized from the groundnut (Arachis hypogea) **plant** and called GnCDPK (M. DasGupta [1994] **Plant** Physiol 104: 961-969). GnCDPK specifically uses the myosin light chain synthetic peptide (MLCpep), which is the phosphate-accepting domain of smooth muscle myosin light chains (KKRPQRATSNVFS), as an exogenous **substrate** under in vitro experimental conditions. In this report we show that GnCDPK undergoes intramolecular autophosphorylation. This self-phosphorylation occurs in threonine residues in a Ca2+-dependent (K-0.5 = 0.5 mu M) and calmodulin-independent manner. The kinase activity toward MLCpep and its sensitivity to Ca2+ were unaffected by prior autophosphorylation when measured under saturating ATP concentrations. The role of autophosphorylation in the exogenous **substrate** MLCpep phosphorylation reaction was reinvestigated at low ATP concentrations. A pronounced lag time of 1 to 2 min, followed by a linear increase of activity for 7.5 min, was seen in the initial rate of MLCpep phosphorylation under such suboptimal conditions. Prior autophosphorylation completely abolished this lag phase, and a sharp rise of exogenous **substrate** phosphorylation was seen from the 1st min. Our results suggest that autophosphorylation is a prerequisite for the activation of GnCDPK.

L36 ANSWER 2 OF 9 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1997:389151 HCAPLUS
DOCUMENT NUMBER: 127:30901
TITLE: Mutants of protein kinase with decreased phosphorylation activity improves the 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase activity in **plant** cells
INVENTOR(S): Machida, Yasunori; Muranaka, Toshiya; Oeda, Kenji
PATENT ASSIGNEE(S): Sumitomo Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09121863	A2	19970513	JP 1995-285839	19951102

AB A method to enhance the HMG-CoA activity in **plant** cells by mutagenizing protein kinase to reduced its phosphorylation activity on HMG-CoA is described. A tobacco protein kinase cNPK5 was site-specifically mutated to replace 48-Lys with Arg and the resultant mutant was unable to phosphorylate 7-Ser of a synthetic oligopeptide. Plasmid p35S-cNPK5(N48R) encoding the protein kinase mutant was used for the transformation of tobacco cells. The growth of roots of the transgenic tobacco **plants** is more efficient than the **plant** transformed with p35S-cNPK5 expressing the wild type protein kinase.

L36 ANSWER 3 OF 9 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1996:363519 HCAPLUS
DOCUMENT NUMBER: 125:27687
TITLE: Use of a non-mammalian DNA virus to express an exogenous gene in a mammalian cell for gene therapy in treatment of gene deficiency disorder or liver cancer
INVENTOR(S): Boyce, Frederick M.
PATENT ASSIGNEE(S): General Hospital Corporation, USA
SOURCE: PCT Int. Appl., 77 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9609074	A1	19960328	WO 1995-US11456	19950908
W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT				
RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
US 5871986	A	19990216	US 1994-311157	19940923
US 5731182	A	19980324	US 1995-486341	19950607
AU 9536750	A1	19960409	AU 1995-36750	19950908
AU 702830	B2	19990304		
EP 785803	A1	19970730	EP 1995-934407	19950908
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE				
JP 10506530	T2	19980630	JP 1995-510940	19950908

PRIORITY APPLN. INFO.:
US 1994-311157 A 19940923
US 1995-486341 A 19950607
WO 1995-US11456 W 19950908

AB Disclosed is a method of expressing an exogenous gene in a mammalian cell, involving infecting the cell with a non-mammalian virus, such as a baculovirus, whose genome carries an exogenous gene, and growing the cell under conditions such that the gene is expressed. Exogenous genes are delivered to mammalian cells by use of a transfer vector such as that described in the figure. Also disclosed is a method of treating a gene deficiency disorder in a mammal by providing to a cell a therapeutically effective amt. of a virus whose genome carries an exogenous gene and growing the cell under conditions such that the exogenous gene is expressed in the mammal.

L36 ANSWER 4 OF 9 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1996:19857 BIOSIS

DOCUMENT NUMBER: PREV199698591992
TITLE: Mechanism of regulation in yeast glycogen phosphorylase.
AUTHOR(S): Lin, Kai; Hwang, Peter K.; Fletterick, Robert J. (1)
CORPORATE SOURCE: (1) Dep. Biochem. Biophysics, Univ. California, San Francisco, CA 94143-0448 USA
SOURCE: Journal of Biological Chemistry, (1995) Vol. 270, No. 45, pp. 26833-26839.
ISSN: 0021-9258.
DOCUMENT TYPE: Article
LANGUAGE: English

AB The mechanism of yeast glycogen phosphorylase activation by covalent phosphorylation involves structural elements distinct from the mammalian homologs. To understand the role of the amino-terminal 39-residue extension in the phosphorylation control mechanism, mutants with 22 and 42 amino-terminal residues removed were expressed in Escherichia coli, and their properties were compared with the wild-type (WT) enzyme. The unphosphorylated WT enzyme had a specific activity of 0.1 unit/mg and was not activated significantly by the **substrate**, glucose 1-phosphate. Phosphorylation by protein kinase resulted in a 1300-fold activation. Glucose 6-phosphate inhibited the unpbosphorylated enzyme more effectively than the phosphorylated form, and inhibition of the latter was cooperative. Glucose was a poor inhibitor for both the unphosphorylated and phosphorylated WT enzyme with K-i gt 300 mM. The rate of phosphorylation by protein kinase depended on **substrates** and interactions of the amino terminus. Maltoheptaose increased the rate of phosphorylation of the WT enzyme by yeast **phosphorylase kinase** 5-fold. The 22-residue deletion mutant (Nd22) had overall kinetic properties similar to the WT enzyme, except that Nd22 was a better **substrate** for the protein kinase and the rate of phosphorylation was unaffected by maltoheptaose. The 42-residue deletion mutant (Nd42), which lacks the phosphorylation site, was measurably active, although much less active than phosphorylated WT. Sedimentatioin equilibrium analysis indicated that the WT, Nd22, and Nd42 exist as tetramer, partially dissociated tetramer, and dimer, respectively. Phosphorylation of the WT and Nd22 converted both to dimer. The results indicated that the amino terminus affects quaternary structure and mediates activity regulation through conformational transition.

L36 ANSWER 5 OF 9 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1993:479902 BIOSIS
DOCUMENT NUMBER: PREV199396113502
TITLE: Metabolic capacity, fibre type area and capillarization of rat **plantaris** muscle: Effects of age, overload and training and relationship with fatigue resistance.
AUTHOR(S): Degens, Hans (1); Veerkamp, Jacques H.; Van Moerkerk, Herman T. B.; Turek, Zdenek; Hoofd, Louis J. C.; Binkhorst, Robert A.
CORPORATE SOURCE: (1) Dep. Physiol., Univ. Nijmegen, P.O. Box 9101, 6500 HB Nijmegen Netherlands Antilles
SOURCE: International Journal of Biochemistry, (1993) Vol. 25, No. 8, pp. 1141-1148.
ISSN: 0020-711X.
DOCUMENT TYPE: Article
LANGUAGE: English

AB The influences of age (5, 13 and 25-month-old rats), overload as obtained by denervation of synergists, and training on the metabolic capacity, relative muscle cross-sectional area occupied by each fibre type, capillarization and fatigue resistance of the rat m. **plantaris** were investigated. Creatine **kinase**, **phosphorylase** and citrate synthase activities were lower in muscles of 25 than in those of 13-month-old rats (P lt 0.001). Overload resulted in an increased relative area of type I and IIa fibres at all ages (P = 0.001). Capillary density

decreased with overload and increasing age (P lt 0.001). Fatigue resistance was higher in muscles of 13 than in those of 5-month-old rats (P lt 0.05), and increased with overload (P lt 0.05) at all ages. Fatigue resistance of the whole muscle was not closely related to its oxidative capacity in contrast to what is generally found for single fibres or motor units.

L36 ANSWER 6 OF 9 MEDLINE DUPLICATE 1
ACCESSION NUMBER: 92111784 MEDLINE
DOCUMENT NUMBER: 92111784 PubMed ID: 1309706
TITLE: Ca(2+)-dependent ubiquitination of calmodulin in yeast.
AUTHOR: Jennissen H P; Botzet G; Majetschak M; Laub M; Ziegenhagen R; Demiroglou A
CORPORATE SOURCE: Institut fur Physiologische Chemie, Universitat-GHS-Essen, Germany.
SOURCE: FEBS LETTERS, (1992 Jan 13) 296 (1) 51-6.
Journal code: EUH; 0155157. ISSN: 0014-5793.
PUB. COUNTRY: Netherlands
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199202
ENTRY DATE: Entered STN: 19920308
Last Updated on STN: 19980206
Entered Medline: 19920219

AB Recently we were able to show that calmodulin from vertebrates, **plants** (spinach) and the mold Neurospora crassa can be covalently conjugated to ubiquitin in a Ca(2+)-dependent manner by ubiquityl-calmodulin synthetase (uCaM-synthetase) from mammalian sources [R. Ziegenhagen and H.P. Jennissen (1990) FEBS Lett. 273, 253-256]. It was therefore of high interest to investigate whether this covalent modification of calmodulin also occurs in one of the simplest eukaryotes, the unicellular Saccharomyces cerevisiae. Yeast calmodulin was therefore purified from bakers yeast. In contrast to calmodulin from spinach and N. crassa it does not activate **phosphorylase kinase**.
Crude yeast uCaM-synthetase conjugated ubiquitin Ca(2+)-dependently to yeast and mammalian (bovine) calmodulin. Yeast calmodulin was also a **substrate** for mammalian (reticulocyte) uCaM-synthetase. As estimated from autoradiograms the monoubiquitination product (first-order conjugate) of yeast calmodulin has an apparent molecular mass of ca. 23-26 kDa and the second-order conjugate an apparent molecular mass of ca. 28-32 kDa. Two to three ubiquitin molecules can be incorporated per yeast calmodulin. Experiments with methylated ubiquitin in the heterologous reticulocyte system indicate that, as with vertebrate calmodulins, only one lysine residue of yeast calmodulin reacts with ubiquitin so that the incorporation of multiple ubiquitin molecules will lead to a polyubiquitin chain. These results also indicate that the ability of coupling ubiquitin to calmodulin was acquired at a very early stage in evolution.

L36 ANSWER 7 OF 9 MEDLINE DUPLICATE 2
ACCESSION NUMBER: 87033674 MEDLINE
DOCUMENT NUMBER: 87033674 PubMed ID: 3021748
TITLE: Differential recognition of calmodulin-enzyme complexes by a conformation-specific anti-calmodulin monoclonal antibody.
AUTHOR: Hansen R S; Beavo J A
CONTRACT NUMBER: AM 21723 (NIADDK)
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (1986 Nov 5) 261 (31) 14636-45.
Journal code: HIV; 2985121R. ISSN: 0021-9258.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)

LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 198611
ENTRY DATE: Entered STN: 19900302
Last Updated on STN: 19970203
Entered Medline: 19861126

AB An anti-calmodulin monoclonal antibody having an absolute requirement for Ca2+ has been produced from mice immunized with a mixture of calmodulin and calmodulin-binding proteins. Radioimmune assays were developed for the determination of its specificity. the epitope for this antibody resides on the COOH-terminal half of the mammalian protein. **Plant** calmodulin or troponin C had little reactivity. The apparent affinity of the antibody for calmodulin was increased approximately 60-fold in the presence of heart calmodulin-dependent phosphodiesterase. The presence of heart phosphodiesterase in the radioimmune assay greatly enhanced the sensitivity for calmodulin. The intrinsic calmodulin subunit of **phosphorylase kinase** and calmodulin which was bound to brain phosphodiesterases was also recognized with high affinity by the antibody. The antibody reacted poorly with calmodulin which was bound to heart or brain calcineurin, skeletal muscle myosin light chain kinase, or other calmodulin-binding proteins. In direct binding experiments, most of the calmodulin-binding proteins studied were unreactive with the antibody. This selectivity allowed purification of heart and two brain calmodulin-dependent cyclic nucleotide phosphodiesterase isozymes on immobilized antibody affinity columns. Phosphodiesterase activity was adsorbed directly from crude samples and specifically eluted with EGTA. Isozyme separation was accomplished using a previously described anti-heart phosphodiesterase monoclonal antibody affinity support. The brain isozymes differed not only in reactivity with the anti-phosphodiesterase antibody, but also in apparent subunit molecular weight, and relative specificity for cAMP and cGMP as **substrates** . The calmodulin activation constants for the brain enzymes were 10-20-fold greater than for the heart enzyme. The data suggest that the binding of ligands to Ca2+/calmodulin induce conformation changes in calmodulin which alter reactivity with the anti-calmodulin monoclonal antibody. The differential antibody reactivity toward calmodulin-enzyme complexes indicates that target proteins either induce very different conformations in calmodulin and/or interact with different geometries relative to the antibody binding site. The anti-calmodulin monoclonal antibody should be useful for the purification of other calmodulin-dependent phosphodiesterases as well as isozymes of **phosphorylase kinase**.

L36 ANSWER 8 OF 9 MEDLINE
ACCESSION NUMBER: 85204817 MEDLINE
DOCUMENT NUMBER: 85204817 PubMed ID: 2987053
TITLE: NAD+ kinase--a review.
AUTHOR: McGuinness E T; Butler J R
SOURCE: INTERNATIONAL JOURNAL OF BIOCHEMISTRY, (1985) 17 (1) 1-11.
Ref: 134
Journal code: E4S; 0250365. ISSN: 0020-711X.
PUB. COUNTRY: ENGLAND: United Kingdom
Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 198506
ENTRY DATE: Entered STN: 19900320
Last Updated on STN: 19970203
Entered Medline: 19850626

AB NAD+ kinase catalyzes the only (known) biochemical reaction leading to the production of NADP+ from NAD+. Most evidence indicates it is found in the

cytoplasm, but reports of its presence in (other) cell bodies can not be discounted. Viewed as a protein, our knowledge of NADK composition and architecture is rudimentary. Though recognized as a large multimeric protein, no agreement is evident for the molecular weight (Mr = approximately 4-65 X 10(4] of the native protein. Is calmodulin an integral subunit of (some, all) NAD+ kinases (analogous to **phosphorylase kinase** in skeletal muscle)? Or is it an external modulator? Consensus is evident that a subunit of molecular weight 30-35 X 10(3) is a component of the mammalian and yeast kinase. In one case (rabbit liver) two types of subunits are reported to give rise to oligomers differing in molecular weight and catalytic activities. Viewed as an enzyme it is not known why such a complex aggregate is needed for what might otherwise appear to a routine phosphorylation reaction. Rapid equilibrium random (for pigeon liver and C. utilis preparations) and ping-pong (for A. vinelandii kinase) mechanisms have been proposed for the reaction, with multiple reactant binding sites indicated for the random cases. From the perspective of enzyme modulation, the demonstration that green **plant** and sea urchin egg kinases are targets for calmodulin regulation by intracellular Ca2+ links NADP+ production in these sources to the multi-level discriminatory control functions inherent to this Ca2+-protein complex. Significant questions arise from the results of various investigators considered in this review. These queries offer fertile ground for the selective design of key experiments directed to a better understanding of NAD+ kinase function and pyridine nucleotide biochemistry.

L36 ANSWER 9 OF 9 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1979:220484 BIOSIS
DOCUMENT NUMBER: BA68:22988
TITLE: USE OF AN ANTIBODY PROBE TO STUDY REGULATION OF GLYCOGEN PHOSPHORYLASE BY ITS AMINO TERMINAL REGION.
AUTHOR(S): JANSKI A M; GRAVES D J
CORPORATE SOURCE: DEP. BIOCHEM. BIOPHYS., IOWA STATE UNIV., AMES, IOWA 50011, USA.
SOURCE: J BIOL CHEM, (1979) 254 (5), 1644-1652.
CODEN: JBCHA3. ISSN: 0021-9258.
FILE SEGMENT: BA; OLD
LANGUAGE: English

AB Antibodies that are specific for the NH2-terminal region of rabbit muscle glycogen phosphorylase were isolated. Studies, using synthetic peptides representing different segments of the NH2-terminal region of muscle phosphorylase, indicated the antibodies are highly specific for the first 4 NH2-terminal residues of the enzyme. The MW of the complex formed between dimeric phosphorylase and the antibodies estimated by gel filtration suggests that only 1 molecule of antibody binds/dimer of phosphorylase. The antibodies were strongly inhibitory to both **phosphorylase kinase** and phosphorylase phosphatase. Apparent binding constants for glucose 1-phosphate and AMP and inhibition by compounds that bind at or near the glucose 1-phosphate and AMP sites were not affected by the antibodies. The apparent Km for the high MW **substrate**, glycogen, was lowered 2-fold by the presence of the antibodies. The primary binding site for maltoheptaose, and presumably for glycogen, recently was a site separate from the active site. The improved binding affinity for glycogen, induced by the antibodies, is consistent with regulation of this glycogen site by the NH2-terminal region. The binding of the antibodies to phosphorylase b completely stabilized the enzyme to loss of its cofactor, pyridoxal 5'-phosphate, under conditions in which the cofactor is normally completely resolved. Because the antibodies did not affect the apparent binding affinities for compounds (glucose, glucose 1-phosphate and caffeine) that bind in the same hydrophobic active site crevice as pyridoxal phosphate, the suggestion is made that the dramatic effect of the antibodies on the pyridoxal

5'-phosphate site is quite specific. The specific antibodies against muscle phosphorylase were able to bind to the liver isozyme of phosphorylase. When antibodies were bound to the liver isozyme, the apparent affinity (Km) for glucose 1-phosphate was improved by 4.1-fold at saturating AMP. At concentrations of glucose 1-phosphate lower than the Km, the antibodies increased enzyme activity by more than 10-fold. The structural character of the NH2-terminal regions of liver and muscle phosphorylase b isozymes may be, at least partially, responsible for their differing affinities for glucose 1-phosphate.

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     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
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L1          6113 S PHOSPHORYLASE (A)KINASE?
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L6       3195886 S PLANT? OR SEED?
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L8             1 S L5 AND L7
L9             1 S L1 AND L7
                 E ALLEN S M/AU
L10          285 S E3
                 E LEE J M/AU
L11         2739 S E3
L12         3022 S L10 OR L11
L13            0 S L1 AND L12
L14           18 S L7 AND L12
L15           17 DUP REM L14 (1 DUPLICATE REMOVED)
L16       969695 S KINASE?
L17            2 S L15 AND L16
L18            0 S L3 AND L12
L19           56 S L2 AND L12
L20            3 S L19 AND L16
L21            5 S "CALCIUM DEPENDENT PHOSPHORYLASE KINASE?"
L22            1 S L21 AND L7
L23            1 S L1 AND L7
L24            1 S L21 AND L6
L25      1725731 S SUBSTRATE? OR GLYCOGEN(A)PHOSPHORYLASE?
L26         1900 S L25 AND L1
L27            1 S L7 AND L26
L28         1789 S "CALCIUM DEPENDENT PROTEIN KINASE?"
L29           13 S L1 AND L28
L30           11 DUP REM L29 (2 DUPLICATES REMOVED)
L31         1745 S (L28 OR L1) AND SUBSTRATE?
L32          491 S L28 AND SUBSTRATE?
L33         1259 S L1 AND SUBSTRATE?
L34          203 S L32 AND PLANT?
L35           16 S L33 AND PLANT?
L36            9 DUP REM L35 (7 DUPLICATES REMOVED)

=> s l36 and l28
L37            1 L36 AND L28

=> d ibib

L37  ANSWER 1 OF 1  SCISEARCH  COPYRIGHT 2002 ISI (R)
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ACCESSION NUMBER: 1999:561209 SCISEARCH
THE GENUINE ARTICLE: 216HW
TITLE: Autophosphorylation-dependent activation of a **calcium-dependent protein kinase** from groundnut
AUTHOR: Chaudhuri S; Seal A; DasGupta M (Reprint)
CORPORATE SOURCE: UNIV CALCUTTA, BALLYGUNGE SCI COLL, DEPT BIOCHEM, 35 BALLYGUNGE CIRCULAR RD, CALCUTTA 700019, W BENGAL, INDIA (Reprint); UNIV CALCUTTA, BALLYGUNGE SCI COLL, DEPT BIOCHEM, CALCUTTA 700019, W BENGAL, INDIA
COUNTRY OF AUTHOR: INDIA
SOURCE: PLANT PHYSIOLOGY, (JUL 1999) Vol. 120, No. 3, pp. 859-866. Publisher: AMER SOC PLANT PHYSIOLOGISTS, 15501 MONONA DRIVE, ROCKVILLE, MD 20855.
ISSN: 0032-0889.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: English
REFERENCE COUNT: 28
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

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(FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS, LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002

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L6	3195886	S	PLANT? OR SEED?
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L8	1	S	L5 AND L7
L9	1	S	L1 AND L7
		E	ALLEN S M/AU
L10	285	S	E3
		E	LEE J M/AU
L11	2739	S	E3
L12	3022	S	L10 OR L11
L13	0	S	L1 AND L12
L14	18	S	L7 AND L12
L15	17	DUP REM	L14 (1 DUPLICATE REMOVED)
L16	969695	S	KINASE?
L17	2	S	L15 AND L16
L18	0	S	L3 AND L12
L19	56	S	L2 AND L12
L20	3	S	L19 AND L16
L21	5	S	"CALCIUM DEPENDENT PHOSPHORYLASE KINASE?"
L22	1	S	L21 AND L7
L23	1	S	L1 AND L7
L24	1	S	L21 AND L6
L25	1725731	S	SUBSTRATE? OR GLYCOGEN(A)PHOSPHORYLASE?
L26	1900	S	L25 AND L1
L27	1	S	L7 AND L26
L28	1789	S	"CALCIUM DEPENDENT PROTEIN KINASE?"
L29	13	S	L1 AND L28
L30	11	DUP REM	L29 (2 DUPLICATES REMOVED)
L31	1745	S	(L28 OR L1) AND SUBSTRATE?
L32	491	S	L28 AND SUBSTRATE?

L33 1259 S L1 AND SUBSTRATE?
L34 203 S L32 AND PLANT?
L35 16 S L33 AND PLANT?
L36 9 DUP REM L35 (7 DUPLICATES REMOVED)
L37 1 S L36 AND L28

=> s l32 and l33
L38 5 L32 AND L33

=> d 1-5 ibib ab

L38 ANSWER 1 OF 5 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1983:229880 BIOSIS
DOCUMENT NUMBER: BA75:79880
TITLE: PHOSPHO LIPID SENSITIVE **CALCIUM DEPENDENT PROTEIN KINASE** FROM HEART 2. **SUBSTRATE** SPECIFICITY AND INHIBITION BY VARIOUS AGENTS.
AUTHOR(S): WISE B C; GLASS D B; CHOU C-H J; RAYNOR R L; KATOH N; SCHATZMAN R C; TURNER R S; KIBLER R F; KUO J F
CORPORATE SOURCE: DEP. NEUROL., EMORY UNIV. SCH. MED., ATLANTA, GEORGIA 30322.
SOURCE: J BIOL CHEM, (1982) 257 (14), 8489-8495.
CODEN: JBCHA3. ISSN: 0021-9258.
FILE SEGMENT: BA; OLD
LANGUAGE: English
AB The specificity of **substrates** (including both phosphate donors and acceptors) for phospholipid-sensitive Ca2+-dependent protein kinase purified (80-95% homogeneous) from bovine heart and inhibition of its activity by various agents were investigated. The apparent Km for ATP, using histone H1 as **substrate**, of the enzyme was 4.4 .mu.M. Phosphorylation by ATP was inhibited most markedly by .alpha.,.beta.-methylene ATP and, to a lesser extent, by adenosine 5'-O-(thiotriphosphate), 2'-deoxy ATP, and .beta.,.gamma.-methylene ATP. The enzyme was able to utilize adenosine 5'-O-(thiotriphosphate) to thiophosphorylate histone H1. Among histone subfractions, peptides and proteins examined, histone H1 (apparent Km = 0.6 .mu.M; Vmax = 0.83 .mu.mol/min per mg of enzyme) and myelin basic protein (apparent Km = 0.3-.mu.M) were the best **substrates** for the enzyme. The enzyme partially purified from rat brain and pig spleen also effectively phosphorylated myelin basic protein, with apparent Km values of 0.5 and 0.8 .mu.M, respectively. Exhaustive phosphorylation of histone H1 and myelin basic protein indicated the numbers of moles of phosphate incorporated per mol of the 2 **substrates** to be 2 and 5, respectively. Oligopeptides containing the amino acid sequences around serine 32 and serine 36 in histone H2B, like histone H2B itself, were relatively ineffective as **substrates**. A heptapeptide containing the amino acid sequence around the serine phosphorylation site in pyruvate kinase, pyruvate kinase itself, **phosphorylase kinase**, myosin light chain, protamine and phosvitin were practically ineffective. The enzyme was inhibited to various degrees by a number of agents, including palmitoylcarnitine, adriamycin, trifluoperazine, polymyxin B,N-(6-aminohexyl)-5-chloro-1-naphthalensulfonamide, heparin and polyamines. Phospholipid-sensitive Ca2+-dependent protein kinase had a protein **substrate** specificity distinguishable from that previously reported for cyclic nucleotide-dependent protein kinases and the calmodulin-sensitive species of Ca2+-dependent protein kinases, such as myosin light chain kinase, and trifluoperazine and N-(6-aminohexyl)-5-chloro-1-naphthalenesulfonamide cannot be considered as selective inhibitors of calmodulin/Ca2+-stimulated enzymes as commonly suggested.

L38 ANSWER 2 OF 5 SCISEARCH COPYRIGHT 2002 ISI (R)

ACCESSION NUMBER: 1999:561209 SCISEARCH
THE GENUINE ARTICLE: 216HW
TITLE: Autophosphorylation-dependent activation of a **calcium-dependent protein kinase** from groundnut
AUTHOR: Chaudhuri S; Seal A; DasGupta M (Reprint)
CORPORATE SOURCE: UNIV CALCUTTA, BALLYGUNGE SCI COLL, DEPT BIOCHEM, 35 BALLYGUNGE CIRCULAR RD, CALCUTTA 700019, W BENGAL, INDIA (Reprint); UNIV CALCUTTA, BALLYGUNGE SCI COLL, DEPT BIOCHEM, CALCUTTA 700019, W BENGAL, INDIA
COUNTRY OF AUTHOR: INDIA
SOURCE: PLANT PHYSIOLOGY, (JUL 1999) Vol. 120, No. 3, pp. 859-866. Publisher: AMER SOC PLANT PHYSIOLOGISTS, 15501 MONONA DRIVE, ROCKVILLE, MD 20855.
ISSN: 0032-0889.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: English
REFERENCE COUNT: 28

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Ca2+-dependent protein kinases (CDPKs) containing a calmodulin-like domain integrated in their primary sequence are present primarily in plants. A member of this family was characterized from the groundnut (Arachis hypogea) plant and called GnCDPK (M. DasGupta [1994] Plant Physiol 104: 961-969). GnCDPK specifically uses the myosin light chain synthetic peptide (MLCpep), which is the phosphate-accepting domain of smooth muscle myosin light chains (KKRPQRATSNVFS), as an exogenous **substrate** under in vitro experimental conditions. In this report we show that GnCDPK undergoes intramolecular autophosphorylation. This self-phosphorylation occurs in threonine residues in a Ca2+-dependent (K-0.5 = 0.5 mu M) and calmodulin-independent manner. The kinase activity toward MLCpep and its sensitivity to Ca2+ were unaffected by prior autophosphorylation when measured under saturating ATP concentrations. The role of autophosphorylation in the exogenous **substrate** MLCpep phosphorylation reaction was reinvestigated at low ATP concentrations. A pronounced lag time of 1 to 2 min, followed by a linear increase of activity for 7.5 min, was seen in the initial rate of MLCpep phosphorylation under such suboptimal conditions. Prior autophosphorylation completely abolished this lag phase, and a sharp rise of exogenous **substrate** phosphorylation was seen from the 1st min. Our results suggest that autophosphorylation is a prerequisite for the activation of GnCDPK.

L38 ANSWER 3 OF 5 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1984:437040 HCAPLUS
DOCUMENT NUMBER: 101:37040
TITLE: Generation, characterization and ELISA of monospecific antibodies against the subunits of a **calcium-dependent protein kinase** and a calcium-transport ATPase from rabbit skeletal muscle
AUTHOR(S): Boehm, Hannelore; Petersen-Von Gehr, Joerg K. H.; Neubauer, Horst P.; Jennissen, Herbert P.
CORPORATE SOURCE: Inst. Physiol., Physiol. Chem. Ernaehrungsphysiol., Ludwig-Maximilians-Univ., Munich, Fed. Rep. Ger.
SOURCE: J. Immunol. Methods (1984), 70(2), 193-209
CODEN: JIMMBG; ISSN: 0022-1759
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Monospecific pptg. sheep antibodies were generated for the first time against the purified, homogeneous .alpha.-, .beta.-, and .gamma.-subunits of the Ca2+-dependent protein **kinase, phosphorylase**

kinase, from rabbit muscle. As ref., antibodies against the holoenzyme and the Ca2+-transport ATPase of sarcoplasmic reticulum were induced. In all cases antibody titers could be quantitated by ELISA. Differentiation of antibody binding was achieved by quant. pptn. and complement fixation assays. In general, maximal antibody titers were reached 56 days after primary immunization and high titers (.apprx.5000) were maintained for several weeks. Anti-.alpha., anti-.beta., and anti-.gamma. avidly ppt. the denatured subunits employed as immunogens as well as the native enzyme. No cross-reactivity between antibodies against a specific subunit and any of the other heterologous subunits was demonstrable in double immunodiffusion assays providing no evidence for immunol. identical sites on the .alpha.-, .beta.-, and .gamma.-subunits. Since anti-.alpha., anti-.beta., and anti-.gamma. strongly inhibit enzyme activity, it is likely that they do so primarily by sterically interfering with the binding of the large **substrate** phosphorylase b to **phosphorylase kinase**. It cannot be excluded, however, that anti-.beta. and anti-.gamma. bind to the active sites on these 2 subunits.

L38 ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1981:79321 HCAPLUS
DOCUMENT NUMBER: 94:79321
TITLE: Studies on calcium(2+) ion-activated, phospholipid-dependent protein kinase; isolation and characterization of a catalytically active fragment
AUTHOR(S): Kishimoto, Akira
CORPORATE SOURCE: Sch. Med., Kobe Univ., Japan
SOURCE: Kobe J. Med. Sci. (1981), 26(3), 183-206
CODEN: KJMDA6; ISSN: 0023-2513
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Limited proteolysis of purified rat brain Ca2+-activated phospholipid-dependent protein kinase (protein kinase C) with Ca2+-dependent mammalian neutral protease resulted in the formation of a catalytically active fragment with a mol. wt. of .apprx.5.1 .times. 104. This fragment was fully active without Ca2+ and phospholipid, indicating that the active site is not located in the phospholipid-binding domain. It did exhibit, however, an abs. requirement for Mg2+ or Mn2+, and also required a thiol, such as mercaptoethanol, glutathione, or cysteine, for activity. It was independent of cyclic nucleotides and had properties differing from those of the catalytic subunit of cGMP- and cAMP-dependent protein kinases. However, it phosphorylated the same specific serine residues in H1 and H2B histones as does cAMP-dependent protein kinase and also phosphorylated muscle **phosphorylase kinase** and glycogen synthase. Thus, protein kinase C possesses similar pleiotropic catalytic activities as those previously described for cAMP-dependent protein kinase. Possible physiol. functions of the proteolytic activation of protein kinase C are discussed.

L38 ANSWER 5 OF 5 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1978:593046 HCAPLUS
DOCUMENT NUMBER: 89:193046
TITLE: The role of **calcium dependent protein kinases** in the regulation of muscle glycogen metabolism
AUTHOR(S): Heilmeyer, Ludwig M. G., Jr.; Varsanyi, Magdolna; Groeschel-Stewart, Ute; Kilimann, Manfred; Djovkar, Assadollah; Hoerl, Walter H.; Jennissen, Herbert P.; Dickneite, Gerhard
CORPORATE SOURCE: Inst. Physiol. Chem., Ruhr-Univ., Bochum, Ger.
SOURCE: Proc. FEBS Meet. (1978), Volume Date 1977, 42(Regul. Mech. Carbohydr. Metab.), 119-27

CODEN: FEBPBY; ISSN: 0071-4402
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Muscle **phosphorylase kinase** (nonphosphorylated form) is activated by Ca2+. This reaction was modulated by Mg2+; at low Mg2+ concns. the enzyme exhibited a basal activity, and at higher Mg2+ concns. an addnl. activity was induced. The basal activity was correlated with satn. of 1 type of binding site (n1) with Ca2+, whereas the satn. of the Mg2+-induced binding site (n4) apparently caused the Mg2+-induced higher activity. A Ca2+-dependent protein kinase was localized in rabbit muscle membranes which accepts phosphorylase b as **substrate**. Antiphosphorylase kinase inhibited Ca2+-ATPase of sarcoplasmic reticulum in the absence or presence of oxalate. Stimulation of ATPase with oxalate was correlated with the inhibition of a protein phosphatase. Hydroxylamine inhibited **phosphorylase kinase** and ATPase activities simultaneously. Basal ATPase activity was not influenced by **phosphorylase kinase** or protein phosphatase, but Ca2+-stimulated activity was inhibited .apprx.90% by the phosphatase and this inhibition was specifically reversed by **phosphorylase kinase**.

=> d his

(FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS, LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002

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L1          6113 S PHOSPHORYLASE (A) KINASE?
L2       1826592 S CALCIUM OR CALMODULIN
L3          1863 S L1 AND L2
L4       5404408 S CLON? OR EXPRESS? OR RECOMBINANT
L5           194 S L3 AND L4
L6       3195886 S PLANT? OR SEED?
L7        178637 S RICE OR ARYZA(A)SATIVA
L8             1 S L5 AND L7
L9             1 S L1 AND L7
                 E ALLEN S M/AU
L10          285 S E3
                 E LEE J M/AU
L11         2739 S E3
L12         3022 S L10 OR L11
L13            0 S L1 AND L12
L14           18 S L7 AND L12
L15           17 DUP REM L14 (1 DUPLICATE REMOVED)
L16       969695 S KINASE?
L17            2 S L15 AND L16
L18            0 S L3 AND L12
L19           56 S L2 AND L12
L20            3 S L19 AND L16
L21            5 S "CALCIUM DEPENDENT PHOSPHORYLASE KINASE?"
L22            1 S L21 AND L7
L23            1 S L1 AND L7
L24            1 S L21 AND L6
L25      1725731 S SUBSTRATE? OR GLYCOGEN(A)PHOSPHORYLASE?
L26         1900 S L25 AND L1
L27            1 S L7 AND L26
L28         1789 S "CALCIUM DEPENDENT PROTEIN KINASE?"
L29           13 S L1 AND L28
L30           11 DUP REM L29 (2 DUPLICATES REMOVED)
L31         1745 S (L28 OR L1) AND SUBSTRATE?
L32          491 S L28 AND SUBSTRATE?
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L33        1259 S L1 AND SUBSTRATE?
L34         203 S L32 AND PLANT?
L35          16 S L33 AND PLANT?
L36           9 DUP REM L35 (7 DUPLICATES REMOVED)
L37           1 S L36 AND L28
L38           5 S L32 AND L33

=> s l1 and l28
L39          13 L1 AND L28

=> dup rem l39
PROCESSING COMPLETED FOR L39
L40          11 DUP REM L39 (2 DUPLICATES REMOVED)

=> d 1-11 ibib ab

L40  ANSWER 1 OF 11  SCISEARCH  COPYRIGHT 2002 ISI (R)
ACCESSION NUMBER:    1999:561209 SCISEARCH
THE GENUINE ARTICLE: 216HW
TITLE:               Autophosphorylation-dependent activation of a
                     calcium-dependent protein
                     kinase from groundnut
AUTHOR:              Chaudhuri S; Seal A; DasGupta M (Reprint)
CORPORATE SOURCE:    UNIV CALCUTTA, BALLYGUNGE SCI COLL, DEPT BIOCHEM, 35
                     BALLYGUNGE CIRCULAR RD, CALCUTTA 700019, W BENGAL, INDIA
                     (Reprint); UNIV CALCUTTA, BALLYGUNGE SCI COLL, DEPT
                     BIOCHEM, CALCUTTA 700019, W BENGAL, INDIA
COUNTRY OF AUTHOR:   INDIA
SOURCE:              PLANT PHYSIOLOGY, (JUL 1999) Vol. 120, No. 3, pp. 859-866.
                     Publisher: AMER SOC PLANT PHYSIOLOGISTS, 15501 MONONA
                     DRIVE, ROCKVILLE, MD 20855.
                     ISSN: 0032-0889.
DOCUMENT TYPE:       Article; Journal
FILE SEGMENT:        LIFE; AGRI
LANGUAGE:            English
REFERENCE COUNT:     28
                    *ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS*
AB      Ca2+-dependent protein kinases (CDPKs) containing a calmodulin-like
     domain integrated in their primary sequence are present primarily in
     plants. A member of this family was characterized from the groundnut
     (Arachis hypogea) plant and called GnCDPK (M. DasGupta [1994] Plant
     Physiol 104: 961-969). GnCDPK specifically uses the myosin light chain
     synthetic peptide (MLCpep), which is the phosphate-accepting domain of
     smooth muscle myosin light chains (KKRPQRATSNVFS), as an exogenous
     substrate under in vitro experimental conditions. In this report we show
     that GnCDPK undergoes intramolecular autophosphorylation. This
     self-phosphorylation occurs in threonine residues in a Ca2+-dependent
     (K-0.5 = 0.5 mu M) and calmodulin-independent manner. The kinase activity
     toward MLCpep and its sensitivity to Ca2+ were unaffected by prior
     autophosphorylation when measured under saturating ATP concentrations. The
     role of autophosphorylation in the exogenous substrate MLCpep
     phosphorylation reaction was reinvestigated at low ATP concentrations. A
     pronounced lag time of 1 to 2 min, followed by a linear increase of
     activity for 7.5 min, was seen in the initial rate of MLCpep
     phosphorylation under such suboptimal conditions. Prior
     autophosphorylation completely abolished this lag phase, and a sharp rise
     of exogenous substrate phosphorylation was seen from the 1st min. Our
     results suggest that autophosphorylation is a prerequisite for the
     activation of GnCDPK.

L40  ANSWER 2 OF 11  BIOSIS  COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE
     1
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ACCESSION NUMBER: 1991:205588 BIOSIS
DOCUMENT NUMBER: BA91:108813
TITLE: **PHOSPHORYLASE KINASE** FROM BOVINE STOMACH SMOOTH MUSCLE A **CALCIUM-DEPENDENT PROTEIN KINASE** ASSOCIATED WITH AN ACTIN-LIKE MOLECULE.
AUTHOR(S): ZEVGOLIS V G; SOTIROUDIS T G; EVANGELOPOULOS A E
CORPORATE SOURCE: INST. BIOL. RES., NATL. HELLENIC RES. FOUND., 48 VASSILEOS CONSTANTINOU AVE., ATHENS 16 35, GREECE.
SOURCE: BIOCHIM BIOPHYS ACTA, (1991) 1091 (2), 222-230. CODEN: BBACAQ. ISSN: 0006-3002.
FILE SEGMENT: BA; OLD
LANGUAGE: English

AB **Phosphorylase kinase** was purified (110-fold) from bovine stomach smooth muscle by a procedure involving DEAE-cellulose chromatography, ammonium sulfate fractionation and glycerol density ultracentrifugation. On sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) the final enzyme preparation shows a single protein band of 43 kDa. The purified protein exhibits a close similarity with bovine aortic actin, as revealed by amino acid analysis and sequencing of a tryptic decapeptide fragment, although it differs widely from actin in several respects. In our effort to separate **phosphorylase kinase** activity from the 43 kDa protein we used a variety of chromatographic procedures, but in all cases the catalytic activity (when eluted) was accompanied by the 43 kDa protein band. Bovine stomach **phosphorylase kinase** exhibits an apparent molecular mass of 950 kDa, it shows a low Vmax value for phosphorylase b (85 nmol .cntdot. min-1 .cntdot. mg-1), a pH 6.8/8.2 activity ratio of 0.23, it has an absolute requirement for Ca2+ and it is activated 1.8-fold by Ca2+/calmodulin. Furthermore, the protein kinase activity is neither inhibited by antibodies against rabbit skeletal muscle **phosphorylase kinase** nor activated by protein phosphorylation. These results suggest that bovine stomach **phosphorylase kinase** is tightly bound to an aggregate of actin-like molecules.

L40 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1986:47453 HCAPLUS
DOCUMENT NUMBER: 104:47453
TITLE: **Calcium-dependent protein kinases** and calmodulin antagonists
AUTHOR(S): Hofmann, Franz
CORPORATE SOURCE: Pharmakol. Inst., Univ. Heidelberg, Heidelberg, 6900, Fed. Rep. Ger.
SOURCE: Calmodulin Antagonists Cell. Physiol. (1985), 287-98. Editor(s): Hidaka, Hiroyoshi; Hartshorne, David J. Academic: Orlando, Fla. CODEN: 54VBAV
DOCUMENT TYPE: Conference; General Review
LANGUAGE: English

AB A review, with 77 refs., of calmodulin-Ca-dependent protein kinases (myosin light- and heavy-chain kinases, membrane-bound protein kinases, multifunctional protein kinases, and **phosphorylase kinase**) and Ca-phospholipid-dependent protein kinase and their inhibition by calmodulin antagonists.

L40 ANSWER 4 OF 11 MEDLINE
ACCESSION NUMBER: 85023304 MEDLINE
DOCUMENT NUMBER: 85023304 PubMed ID: 6541504
TITLE: Homology of the gamma subunit of phosphorylase b kinase with cAMP-dependent protein kinase.
AUTHOR: Reimann E M; Titani K; Ericsson L H; Wade R D; Fischer E H;

Walsh K A
CONTRACT NUMBER: AM 07902 (NIADDK)
AM 19231 (NIADDK)
GM 15731 (NIGMS)
+
SOURCE: BIOCHEMISTRY, (1984 Aug 28) 23 (18) 4185-92.
Journal code: A0G; 0370623. ISSN: 0006-2960.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 198412
ENTRY DATE: Entered STN: 19900320
Last Updated on STN: 19970203
Entered Medline: 19841212

AB The complete amino acid sequence of the catalytic subunit (gamma subunit) of rabbit skeletal muscle phosphorylase b kinase was determined. The gamma subunit was purified by gel filtration in acidic 8 M urea after reduction and S-carboxymethylation in 7 M guanidine hydrochloride. Cleavage of the gamma subunit at arginyl bonds gave a complete set of nonoverlapping peptides. Overlapping peptides were obtained by cleavage at methionyl, tryptophanyl, or glutamyl bonds and by selected subdigestion of two large peptides obtained by cleavage at methionyl bonds. Sequence analysis established that the protein contains 386 residues corresponding to a molecular weight (Mr) of 44673. Comparison of the gamma subunit with the catalytic subunit of bovine cAMP-dependent protein kinase and with tyrosine-specific kinases of viral origin revealed a significant degree of sequence identity among all of these proteins. These data suggest that **calcium-dependent protein kinases** may share a common ancestral gene and a common structural basis for catalytic function with a wide variety of other protein kinases which respond to different signals and control quite different processes.

L40 ANSWER 5 OF 11 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 2
ACCESSION NUMBER: 1985:220395 BIOSIS
DOCUMENT NUMBER: BA79:391
TITLE: **CALCIUM-DEPENDENT PROTEIN KINASE** INJECTION IN A PHOTORECEPTOR MIMICS BIOPHYSICAL EFFECTS OF ASSOCIATIVE LEARNING.
AUTHOR(S): ACOSTA-URQUIDI J; ALKON D L; NEARY J T
CORPORATE SOURCE: SECT. NEURAL SYSTEMS, LAB. BIOPHYSICS, NATL. INST. HEALTH, MARINE BIOL. LAB., WOODS HOLE, MASS. 02543.
SOURCE: SCIENCE (WASH D C), (1984) 224 (4654), 1254-1257.
CODEN: SCIEAS. ISSN: 0036-8075.
FILE SEGMENT: BA; OLD
LANGUAGE: English

AB Iontophoretic injection of **phosphorylase kinase**, a Ca2+-calmodulin-dependent protein kinase, increased input resistance, enhanced the long-lasting depolarization component of the light responses and reduced the early transient outward K+ current, IA and the late K+ currents, IB, in type B photoreceptors of Hermissenda crassicornis in a Ca2+-dependent manner. Since behavioral and biophysical studies have shown that similar membrane changes persist after associative conditioning, Ca2+-dependent protein phosphorylation could mediate the long-term modulation of specific K+ channels as a step in the generation of a conditioned behavioral change.

L40 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1984:437040 HCAPLUS
DOCUMENT NUMBER: 101:37040
TITLE: Generation, characterization and ELISA of monospecific

antibodies against the subunits of a **calcium -dependent protein kinase** and a calcium-transport ATPase from rabbit skeletal muscle

AUTHOR(S): Boehm, Hannelore; Petersen-Von Gehr, Joerg K. H.; Neubauer, Horst P.; Jennissen, Herbert P.

CORPORATE SOURCE: Inst. Physiol., Physiol. Chem. Ernaehrungsphysiol., Ludwig-Maximilians-Univ., Munich, Fed. Rep. Ger.

SOURCE: J. Immunol. Methods (1984), 70(2), 193-209
CODEN: JIMMBG; ISSN: 0022-1759

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Monospecific pptg. sheep antibodies were generated for the first time against the purified, homogeneous .alpha.-, .beta.-, and .gamma.-subunits of the Ca2+-dependent protein **kinase, phosphorylase kinase,** from rabbit muscle. As ref., antibodies against the holoenzyme and the Ca2+-transport ATPase of sarcoplasmic reticulum were induced. In all cases antibody titers could be quantitated by ELISA. Differentiation of antibody binding was achieved by quant. pptn. and complement fixation assays. In general, maximal antibody titers were reached 56 days after primary immunization and high titers (.apprx.5000) were maintained for several weeks. Anti-.alpha., anti-.beta., and anti-.gamma. avidly ppt. the denatured subunits employed as immunogens as well as the native enzyme. No cross-reactivity between antibodies against a specific subunit and any of the other heterologous subunits was demonstrable in double immunodiffusion assays providing no evidence for immunol. identical sites on the .alpha.-, .beta.-, and .gamma.-subunits. Since anti-.alpha., anti-.beta., and anti-.gamma. strongly inhibit enzyme activity, it is likely that they do so primarily by sterically interfering with the binding of the large substrate phosphorylase b to **phosphorylase kinase**. It cannot be excluded, however, that anti-.beta. and anti-.gamma. bind to the active sites on these 2 subunits.

L40 ANSWER 7 OF 11 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.

ACCESSION NUMBER: 1983:229880 BIOSIS

DOCUMENT NUMBER: BA75:79880

TITLE: PHOSPHO LIPID SENSITIVE **CALCIUM DEPENDENT PROTEIN KINASE** FROM HEART 2. SUBSTRATE SPECIFICITY AND INHIBITION BY VARIOUS AGENTS.

AUTHOR(S): WISE B C; GLASS D B; CHOU C-H J; RAYNOR R L; KATOH N; SCHATZMAN R C; TURNER R S; KIBLER R F; KUO J F

CORPORATE SOURCE: DEP. NEUROL., EMORY UNIV. SCH. MED., ATLANTA, GEORGIA 30322.

SOURCE: J BIOL CHEM, (1982) 257 (14), 8489-8495.
CODEN: JBCHA3. ISSN: 0021-9258.

FILE SEGMENT: BA; OLD

LANGUAGE: English

AB The specificity of substrates (including both phosphate donors and acceptors) for phospholipid-sensitive Ca2+-dependent protein kinase purified (80-95% homogeneous) from bovine heart and inhibition of its activity by various agents were investigated. The apparent Km for ATP, using histone H1 as substrate, of the enzyme was 4.4 .mu.M. Phosphorylation by ATP was inhibited most markedly by .alpha.,.beta.-methylene ATP and, to a lesser extent, by adenosine 5'-O-(thiotriphosphate), 2'-deoxy ATP, and .beta.,.gamma.-methylene ATP. The enzyme was able to utilize adenosine 5'-O-(thiotriphosphate) to thiophosphorylate histone H1. Among histone subfractions, peptides and proteins examined, histone H1 (apparent Km = 0.6 .mu.M; Vmax = 0.83 .mu.mol/min per mg of enzyme) and myelin basic protein (apparent Km = 0.3-.mu.M) were the best substrates for the enzyme. The enzyme partially purified from rat brain and pig spleen also effectively phosphorylated

myelin basic protein, with apparent Km values of 0.5 and 0.8 .mu.M, respectively. Exhaustive phosphorylation of histone H1 and myelin basic protein indicated the numbers of moles of phosphate incorporated per mol of the 2 substrates to be 2 and 5, respectively. Oligopeptides containing the amino acid sequences around serine 32 and serine 36 in histone H2B, like histone H2B itself, were relatively ineffective as substrates. A heptapeptide containing the amino acid sequence around the serine phosphorylation site in pyruvate kinase, pyruvate kinase itself, **phosphorylase kinase**, myosin light chain, protamine and phosvitin were practically ineffective. The enzyme was inhibited to various degrees by a number of agents, including palmitoylcarnitine, adriamycin, trifluoperazine, polymyxin B,N-(6-aminohexyl)-5-chloro-1-naphthalensulfonamide, heparin and polyamines. Phospholipid-sensitive Ca2+-dependent protein kinase had a protein substrate specificity distinguishable from that previously reported for cyclic nucleotide-dependent protein kinases and the calmodulin-sensitive species of Ca2+-dependent protein kinases, such as myosin light chain kinase, and trifluoperazine and N-(6-aminohexyl)-5-chloro-1-naphthalenesulfonamide cannot be considered as selective inhibitors of calmodulin/Ca2+-stimulated enzymes as commonly suggested.

L40 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1981:79321 HCAPLUS
DOCUMENT NUMBER: 94:79321
TITLE: Studies on calcium(2+) ion-activated, phospholipid-dependent protein kinase; isolation and characterization of a catalytically active fragment
AUTHOR(S): Kishimoto, Akira
CORPORATE SOURCE: Sch. Med., Kobe Univ., Japan
SOURCE: Kobe J. Med. Sci. (1981), 26(3), 183-206
CODEN: KJMDA6; ISSN: 0023-2513
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Limited proteolysis of purified rat brain Ca2+-activated phospholipid-dependent protein kinase (protein kinase C) with Ca2+-dependent mammalian neutral protease resulted in the formation of a catalytically active fragment with a mol. wt. of .apprx.5.1 .times. 104. This fragment was fully active without Ca2+ and phospholipid, indicating that the active site is not located in the phospholipid-binding domain. It did exhibit, however, an abs. requirement for Mg2+ or Mn2+, and also required a thiol, such as mercaptoethanol, glutathione, or cysteine, for activity. It was independent of cyclic nucleotides and had properties differing from those of the catalytic subunit of cGMP- and cAMP-dependent protein kinases. However, it phosphorylated the same specific serine residues in H1 and H2B histones as does cAMP-dependent protein kinase and also phosphorylated muscle **phosphorylase kinase** and glycogen synthase. Thus, protein kinase C possesses similar pleiotropic catalytic activities as those previously described for cAMP-dependent protein kinase. Possible physiol. functions of the proteolytic activation of protein kinase C are discussed.

L40 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1978:593046 HCAPLUS
DOCUMENT NUMBER: 89:193046
TITLE: The role of **calcium dependent protein kinases** in the regulation of muscle glycogen metabolism
AUTHOR(S): Heilmeyer, Ludwig M. G., Jr.; Varsanyi, Magdolna; Groeschel-Stewart, Ute; Kilimann, Manfred; Djovkar, Assadollah; Hoerl, Walter H.; Jennissen, Herbert P.; Dickneite, Gerhard
CORPORATE SOURCE: Inst. Physiol. Chem., Ruhr-Univ., Bochum, Ger.

SOURCE: Proc. FEBS Meet. (1978), Volume Date 1977, 42(Regul. Mech. Carbohydr. Metab.), 119-27
CODEN: FEBPBY; ISSN: 0071-4402
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Muscle **phosphorylase kinase** (nonphosphorylated form) is activated by Ca2+. This reaction was modulated by Mg2+; at low Mg2+ concns. the enzyme exhibited a basal activity, and at higher Mg2+ concns. an addnl. activity was induced. The basal activity was correlated with satn. of 1 type of binding site (n1) with Ca2+, whereas the satn. of the Mg2+-induced binding site (n4) apparently caused the Mg2+-induced higher activity. A Ca2+-dependent protein kinase was localized in rabbit muscle membranes which accepts phosphorylase b as substrate. Antiphosphorylase kinase inhibited Ca2+-ATPase of sarcoplasmic reticulum in the absence or presence of oxalate. Stimulation of ATPase with oxalate was correlated with the inhibition of a protein phosphatase. Hydroxylamine inhibited **phosphorylase kinase** and ATPase activities simultaneously. Basal ATPase activity was not influenced by **phosphorylase kinase** or protein phosphatase, but Ca2+-stimulated activity was inhibited .apprx.90% by the phosphatase and this inhibition was specifically reversed by **phosphorylase kinase**.

L40 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1977:579763 HCAPLUS
DOCUMENT NUMBER: 87:179763
TITLE: Studies on a cyclic nucleotide-independent protein kinase and its proenzyme in mammalian tissues. II. Proenzyme and its activation by calcium-dependent protease from rat brain
AUTHOR(S): Inoue, Masanori; Kishimoto, Akira; Takai, Yoshimi; Nishizuka, Yasutomi
CORPORATE SOURCE: Dep. Biochem., Kobe Univ. Sch. Med., Kobe, Japan
SOURCE: J. Biol. Chem. (1977), 252(21), 7610-16
CODEN: JBCHA3
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A proenzyme (I) of bovine cerebellum protein kinase (II) was found in the sol. fraction of rat brain. Upon limited proteolysis by Ca2+-dependent protease (III) occurring in the same tissue, I was converted to an active I which could phosphorylate 5 species of histone fractions. Trypsin also catalyzed the conversion. I and III were sepd. by DEAE-cellulose column chromatog. By this procedure I was resolved into 2 components; each was purified further by gel filtration followed by isoelectrofocusing electrophoresis. Both components showed a sedimentation coeff. of .apprx.5.1 with a mol. wt. of 7.7 .times. 104 and a Stokes radius of .apprx.42 .ANG.. Upon isoelectrofocusing electrophoresis, I exhibited heterogeneity with isoelec. points of 4.0-5.6. I showed no gycogen **phosphorylase kinase** activity but was always assocd. with activity to phosphorylate protamine. III was also purified further by gel filtration followed by DEAE-cellulose column chromatog. III showed a sedimentation coeff. of .apprx.5.8 with a mol. wt. of 9.3 .times. 104, a Stokes radius of .apprx.47 .ANG., and an isoelec. point of 4.8. III required a divalent cation almost absolutely; Ca2+ was most active and the max. activity was obtained at 3 mM. Sr2+ and Mn2+ were 24% and 11% as active as Ca2+, resp., but other cations including Mg2+, Ba2+, Zn2+, and Cu2+ were inactive. The optimum pH of III was 7.5-8.5. Active II thus produced from I in vitro showed a sedimentation coeff. of .apprx.3.9 with a mol. wt. of 5.1 .times. 104 and a Stokes radius of .apprx.38 .ANG.. Although these values were slightly different from those of II which was obtained from bovine cerebellum stored frozen, the active II enzymes were indistinguishable from each other in their kinetic and catalytic

properties. A preliminary survey revealed that I and II were distributed in many other tissues, including lung, liver, kidney, cerebellum, heart, skeletal muscle, and adipose tissue.

L40 ANSWER 11 OF 11 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1975:93784 BIOSIS
DOCUMENT NUMBER: BR11:93784
TITLE: EVIDENCE FOR THE PRESENCE OF A **CALCIUM DEPENDENT PROTEIN KINASE PHOSPHORYLASE KINASE** EC-2.7.1.37 IN SARCOPLASMIC RETICULUM MEMBRANES.
AUTHOR(S): HOERL W H; JENNISSEN H P; GROESCHEL-STEWART U; HEILMEYER L M G JR
SOURCE: Hoppe-Seyler's Z. Physiol. Chem., (1975) 356 (3), 239. CODEN: HSZPAZ. ISSN: 0018-4888.
DOCUMENT TYPE: Conference
FILE SEGMENT: BR; OLD
LANGUAGE: Unavailable

=> d his

(FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS, LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002

L1	6113	S	PHOSPHORYLASE (A)KINASE?
L2	1826592	S	CALCIUM OR CALMODULIN
L3	1863	S	L1 AND L2
L4	5404408	S	CLON? OR EXPRESS? OR RECOMBINANT
L5	194	S	L3 AND L4
L6	3195886	S	PLANT? OR SEED?
L7	178637	S	RICE OR ARYZA(A)SATIVA
L8	1	S	L5 AND L7
L9	1	S	L1 AND L7
		E	ALLEN S M/AU
L10	285	S	E3
		E	LEE J M/AU
L11	2739	S	E3
L12	3022	S	L10 OR L11
L13	0	S	L1 AND L12
L14	18	S	L7 AND L12
L15	17	DUP REM	L14 (1 DUPLICATE REMOVED)
L16	969695	S	KINASE?
L17	2	S	L15 AND L16
L18	0	S	L3 AND L12
L19	56	S	L2 AND L12
L20	3	S	L19 AND L16
L21	5	S	"CALCIUM DEPENDENT PHOSPHORYLASE KINASE?"
L22	1	S	L21 AND L7
L23	1	S	L1 AND L7
L24	1	S	L21 AND L6
L25	1725731	S	SUBSTRATE? OR GLYCOGEN(A)PHOSPHORYLASE?
L26	1900	S	L25 AND L1
L27	1	S	L7 AND L26
L28	1789	S	"CALCIUM DEPENDENT PROTEIN KINASE?"
L29	13	S	L1 AND L28
L30	11	DUP REM	L29 (2 DUPLICATES REMOVED)
L31	1745	S	(L28 OR L1) AND SUBSTRATE?
L32	491	S	L28 AND SUBSTRATE?
L33	1259	S	L1 AND SUBSTRATE?
L34	203	S	L32 AND PLANT?

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L35          16 S L33 AND PLANT?
L36           9 DUP REM L35 (7 DUPLICATES REMOVED)
L37           1 S L36 AND L28
L38           5 S L32 AND L33
L39          13 S L1 AND L28
L40          11 DUP REM L39 (2 DUPLICATES REMOVED)

=>
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=> s  l1 and homolog?
L41         210 L1 AND HOMOLOG?

=> s l41 and structur?
L42          92 L41 AND STRUCTUR?

=> dup rem l42
PROCESSING COMPLETED FOR L42
L43          41 DUP REM L42 (51 DUPLICATES REMOVED)

=> d 1-10 ibib ab

L43  ANSWER 1 OF 41  SCISEARCH  COPYRIGHT 2002 ISI (R)
ACCESSION NUMBER:    2002:76584  SCISEARCH
THE GENUINE ARTICLE: 514HR
TITLE:               Structural basis for the activation of anthrax
                     adenylyl cyclase exotoxin by calmodulin
AUTHOR:              Drum C L; Yan S Z; Bard J; Shen Y Q; Lu D; Soelalman S;
                     Grabarek Z; Bohm A; Tang W J (Reprint)
CORPORATE SOURCE:    Univ Chicago, Ben May Inst Canc Res, 924 E 57th St,
                     Chicago, IL 60637 USA (Reprint); Univ Chicago, Ben May
                     Inst Canc Res, Chicago, IL 60637 USA; Univ Chicago, Comm
                     Neurobiol, Chicago, IL 60637 USA; Boston Biomed Res Inst,
                     Watertown, MA 02472 USA; Tufts Univ, Sch Med, Boston, MA
                     02111 USA
COUNTRY OF AUTHOR:   USA
SOURCE:              NATURE, (24 JAN 2002) Vol. 415, No. 6870, pp. 396-402.
                     Publisher: MACMILLAN PUBLISHERS LTD, PORTERS SOUTH, 4
                     CRINAN ST, LONDON N1 9XW, ENGLAND.
                     ISSN: 0028-0836.
DOCUMENT TYPE:       Article; Journal
LANGUAGE:            English
REFERENCE COUNT:     51
                    *ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS*
AB       Oedema factor, a calmodulin-activated adenylyl cyclase, is important in
     the pathogenesis of anthrax. Here we report the X-ray structures
     of oedema factor with and without bound calmodulin. Oedema factor shares
     no significant structural homology with mammalian
     adenylyl cyclases or other proteins. In the active site, 39-deoxy-ATP and
     a single metal ion are well positioned for catalysis with histidine 351 as
     the catalytic base. This mechanism differs from the mechanism of
     two-metal-ion catalysis proposed for mammalian adenylyl cyclases. Four
     discrete regions of oedema factor form a surface that recognizes an
     extended conformation of calmodulin, which is very different from the
     collapsed conformation observed in other structures of
     calmodulin bound to effector peptides. On calmodulin binding, an oedema
     factor helical domain of relative molecular mass 15,000 undergoes a 15
     Angstrom translation and a 30degrees rotation away from the oedema factor
     catalytic core, which stabilizes a disordered loop and leads to enzyme
     activation. These allosteric changes provide the first molecular details
     of how calmodulin modulates one of its targets.

L43  ANSWER 2 OF 41  SCISEARCH  COPYRIGHT 2002 ISI (R)
ACCESSION NUMBER:    2001:850677  SCISEARCH
THE GENUINE ARTICLE: 484CT
TITLE:               A protein kinase associated with apoptosis and tumor
                     suppression - Structure, activity, and discovery
                     of peptide substrates
AUTHOR:              Velentza A V; Schumacher A M; Weiss C; Egli M; Watterson D
                     M (Reprint)
CORPORATE SOURCE:    Northwestern Univ, Drug Discovery Program, 303 E Chicago
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Ave, Ward 8-196, Chicago, IL 60611 USA (Reprint); Northwestern Univ, Drug Discovery Program, Chicago, IL 60611 USA; Northwestern Univ, Dept Biol Chem & Mol Pharmacol, Chicago, IL 60611 USA; Vanderbilt Univ, Dept Biol Sci, Nashville, TN 37235 USA
COUNTRY OF AUTHOR: USA
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (19 OCT 2001) Vol. 276, No. 42, pp. 38956-38965.
Publisher: AMER SOC BIOCHEMISTRY MOLECULAR BIOLOGY INC, 9650 ROCKVILLE PIKE, BETHESDA, MD 20814 USA.
ISSN: 0021-9258.
DOCUMENT TYPE: Article; Journal
LANGUAGE: English
REFERENCE COUNT: 34
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Death-associated protein kinase (DAPK) has been implicated in apoptosis and tumor suppression, depending on cellular conditions, and associated with mechanisms of disease. However, DAPK has not been characterized as an enzyme due to the lack of protein or peptide substrates. Therefore, we determined the **structure** of DAPK catalytic domain, used a **homology** model of docked peptide substrate, and synthesized positional scanning substrate libraries in order to discover peptide substrates with K-m values in the desired 10 muM range and to obtain knowledge about the preferences of DAPK for phosphorylation site sequences. Mutagenesis of DAPK catalytic domain at amino acids conserved among protein kinases or unique to DAPK provided a link between **structure** and activity. An enzyme assay for DAPK was developed and used to measure activity in adult brain and monitor protein purification based on the physical and chemical properties of the open reading frame of the DAPK cDNA. The results allow insight into substrate preferences and regulation of DAPK, provide a foundation for proteomic investigations and inhibitor discovery, and demonstrate the utility of the experimental approach, which can be extended potentially to kinase open reading frames identified by genome sequencing projects or functional genetics screens and lacking a known substrate.

L43 ANSWER 3 OF 41 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 2001:345164 HCAPLUS
DOCUMENT NUMBER: 135:43020
TITLE: Bridging the information gap: Computational tools for intermediate resolution **structure** interpretation
AUTHOR(S): Jiang, Wen; Baker, Matthew L.; Ludtke, Steven J.; Chiu, Wah
CORPORATE SOURCE: Program in Structural and Computational Biology and Molecular Biophysics, Baylor College of Medicine, Houston, TX, 77030, USA
SOURCE: Journal of Molecular Biology (2001), 308(5), 1033-1044
CODEN: JMOBAK; ISSN: 0022-2836
PUBLISHER: Academic Press
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Due to large sizes and complex nature, few large macromol. complexes have been solved to at. resoln. This has lead to an under-representation of these **structures**, which are composed of novel and/or **homologous** folds, in the library of known **structures** and folds. While it is often difficult to achieve a high-resoln. model for these **structures**, x-ray crystallog. and electron cryomicroscopy are capable of detg. **structures** of large assemblies at low to intermediate resolns. To aid in the interpretation and anal. of such **structures**, we have developed two programs: helix hunter and fold hunter. Helixhunter is capable of reliably identifying helix position,

orientation and length using a five-dimensional cross-correlation search of a three-dimensional d. map followed by feature extn. Helixhunter's results can in turn be used to probe a library of secondary **structure** elements derived from the **structures** in the Protein Data Bank (PDB). From this anal., it is then possible to identify potential **homologous** folds or suggest novel folds based on the arrangement of alpha helix elements, resulting in a **structure** -based recognition of folds contg. alpha helixes. Foldhunter uses a six-dimensional cross-correlation search allowing a probe **structure** to be fitted within a region or component of a target **structure**. The **structural** fitting therefore provides a quant. means to further examine the architecture and organization of large, complex assemblies. These two methods have been successfully tested with simulated **structures** modeled from the PDB at resolns. between 6 and 12 .ANG.. With the integration of helixhunter and foldhunter into sequence and **structural** informatics techniques, we have the potential to deduce or confirm known or novel folds in domains or components within large complexes. (c) 2001 Academic Press.

REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 4 OF 41 MEDLINE

ACCESSION NUMBER: 2001069324 MEDLINE
DOCUMENT NUMBER: 20519592 PubMed ID: 10938087
TITLE: Identification of binding sites on protein targeting to glycogen for enzymes of glycogen metabolism.
AUTHOR: Fong N M; Jensen T C; Shah A S; Parekh N N; Saltiel A R; Brady M J
CORPORATE SOURCE: Department of Cell Biology, Pfizer Global Research and Development, Ann Arbor, Michigan 48105, USA.
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (2000 Nov 10) 275 (45) 35034-9.
Journal code: HIV. ISSN: 0021-9258.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200101
ENTRY DATE: Entered STN: 20010322
Last Updated on STN: 20010322
Entered Medline: 20010104

AB The activation of protein phosphastase-1 (PP1) by insulin plays a critical role in the regulation of glycogen metabolism. PTG is a PP1 glycogen-targeting protein, which also binds the PP1 substrates glycogen synthase, glycogen phosphorylase, and **phosphorylase kinase** (Printen, J. A., Brady, M. J., and Saltiel, A. R. (1997) Science 275, 1475-1478). Through a combination of deletion analysis and site-directed mutagenesis, the regions on PTG responsible for binding PP1 and its substrates have been delineated. Mutagenesis of Val-62 and Phe-64 in the highly conserved (K/R)VXF PP1-binding motif to alanine was sufficient to ablate PP1 binding to PTG. **Phosphorylase kinase**, glycogen synthase, and phosphorylase binding all mapped to the same C-terminal region of PTG. Mutagenesis of Asp-225 and Glu-228 to alanine completely blocked the interaction between PTG and these three enzymes, without affecting PP1 binding. Disruption of either PP1 or substrate binding to PTG blocked the stimulation of PP1 activity in vitro against phosphorylase, indicating that both binding sites may be important in PTG action. Transient overexpression of wild-type PTG in Chinese hamster ovary cells overexpressing the insulin receptor caused a 50-fold increase in glycogen levels. Expression of PTG mutants that do not bind PP1 had no effect on glycogen accumulation, indicating that PP1 targeting is essential for PTG function. Likewise, expression of the PTG mutants

that do not bind PP1 substrates did not increase glycogen levels, indicating that PP1 targeting glycogen is not sufficient for the metabolic effects of PTG. These results cumulatively demonstrate that PTG serves as a molecular scaffold, allowing PP1 to recognize its substrates at the glycogen particle.

L43 ANSWER 5 OF 41 SCISEARCH COPYRIGHT 2002 ISI (R)
ACCESSION NUMBER: 2000:114036 SCISEARCH
THE GENUINE ARTICLE: 280XA
TITLE: Specificity determinants of substrate recognition by the protein kinase DYRK1A
AUTHOR: Himpel S; Tegge W; Frank R; Leder S; Joost H G; Becker W (Reprint)
CORPORATE SOURCE: RHEIN WESTFAL TH AACHEN, FAK MED, INST PHARMAKOL & TOXIKOL, WENDLINGWEG 2, D-52057 AACHEN, GERMANY (Reprint); RHEIN WESTFAL TH AACHEN, FAK MED, INST PHARMAKOL & TOXIKOL, D-52057 AACHEN, GERMANY; AG MOL ERKENNUNG, GBF, D-38124 BRAUNSCHWEIG, GERMANY
COUNTRY OF AUTHOR: GERMANY
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (28 JAN 2000) Vol. 275, No. 4, pp. 2431-2438.
Publisher: AMER SOC BIOCHEMISTRY MOLECULAR BIOLOGY INC, 9650 ROCKVILLE PIKE, BETHESDA, MD 20814.
ISSN: 0021-9258.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE
LANGUAGE: English
REFERENCE COUNT: 61
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB DYRK1A is a dual-specificity protein kinase that is thought to be involved in brain development. We identified a single phosphorylated amino acid residue in the DYRK substrate histone H3 (threonine 45) by mass spectrometry, phosphoamino acid analysis, and protein sequencing. Exchange of threonine 45 for alanine abolished phosphorylation of histone H3 by DYRK1A and by the related kinases DYRK1B, DYRK2, and DYRK3 but not by CLK8, In order to define the consensus sequence for the substrate specificity of DYRK1A, a library of 300 peptides was designed in variation of the H3 phosphorylation site. Evaluation of the phosphate incorporation into these peptides identified DYRK1A as a proline-directed kinase with a phosphorylation consensus sequence (RPX(S/T)P) similar to that of ERK2 (PX(S/T)P). A peptide designed after the optimal substrate sequence (DYRKtide) was efficiently phosphorylated by DYRK1A (K-m = 35 mu m) but not by ERK2, Both ERK2 and DYRK1A phosphorylated myelin basic protein, whereas only ERK2, but not DYRK1A phosphorylated the mitogen-activated protein kinase substrate ELK-1, This marked difference in substrate specificity between DYRK1A and ERK2 can be explained by the requirement for an arginine at the P -3 site of DYRK substrates and its presumed interaction with aspartate 247 conserved in all DYRKs.

L43 ANSWER 6 OF 41 MEDLINE
ACCESSION NUMBER: 2000481058 MEDLINE
DOCUMENT NUMBER: 20431384 PubMed ID: 10976872
TITLE: Activation of calcium/calmodulin regulated kinases.
AUTHOR: Wilmann M; Gautel M; Mayans O
CORPORATE SOURCE: EMBL, Hamburg, Germany.. wilmanns@embl-hamburg.de
SOURCE: CELLULAR AND MOLECULAR BIOLOGY, (2000 Jul) 46 (5) 883-94.
Journal code: BNA; 9216789. ISSN: 0145-5680.
PUB. COUNTRY: France
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200010

ENTRY DATE: Entered STN: 20001019
Last Updated on STN: 20001019
Entered Medline: 20001012

AB Among numerous protein kinases found in mammalian cell systems there is a distinct subfamily of serine/threonine kinases that are regulated by calmodulin or other related activators in a calcium concentration dependent manner. Members of this family are involved in various cellular processes like cell proliferation and death, cell motility and metabolic pathways. In this contribution we shall review the available **structural** biology data on five members of this kinase family (calcium/calmodulin dependent kinase, twitchin kinase, titin **kinase, phosphorylase kinase,** myosin light chain kinase). As a common element, all these kinases contain a regulatory tail, which is C-terminal to their catalytic domain. The available 3D **structures** of two members, the serine/threonine kinases of the giant muscle proteins twitchin and titin in the autoinhibited conformation, show how this regulatory tail blocks their active sites. The **structures** suggest that activation of these kinases requires unblocking the active site from the C-terminal extension and conformational rearrangement of the active site loops. Small angle scattering data for myosin light chain kinase indicate a complete release of the C-terminal extension upon calcium/calmodulin binding. In addition, members of this family are regulated by diverse add-on mechanisms, including phosphorylation of residues within the activation segment or the P+1 loop as well as by additional regulatory subunits. The available **structural** data lead to the hypothesis of two different activation mechanisms upon binding to calcium sensitive proteins. In one model, the regulatory tail is entirely released ("fall-apart"). The alternative model ("looping-out") proposes a two-anchored release mechanism.

L43 ANSWER 7 OF 41 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 2000:307728 HCAPLUS
DOCUMENT NUMBER: 133:85875
TITLE: Enzymes and proteins containing manganese: an overview
AUTHOR(S): Crowley, James D.; Traynor, Deborah A.; Weatherburn, David C.
CORPORATE SOURCE: School of Chemical and Physical Sciences, Victoria University of Wellington, Wellington, N. Z.
SOURCE: Metal Ions in Biological Systems (2000), 37(Manganese and Its Role in Biological Processes), 209-278
CODEN: MIBSCD; ISSN: 0161-5149
PUBLISHER: Marcel Dekker, Inc.
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English

AB A review with 373 refs. Now it is obvious that manganese in the active sites of enzymes can catalyze a very wide variety of different reactions. There has been an enormous expansion of our knowledge of Mn-contg. enzymes over the last 10 yr; however, all of the newly characterized enzymes involve the Mn(II) oxidn. state. Whether all the Mn(III)- or Mn(IV)contg. enzymes have already been discovered is for the future to det. Obsd. coordination nos. of manganese ion in proteins varies from four to seven. Only nitrogen and oxygen donor atoms are obsd.; sulfur donors have not yet been obsd. Results of the rapidly increasing no. of **structural** studies are beginning to show a no. of **structural homologies**. For example, the binding of the ATP analog AMPPNP to Mn2+ in the carboxyphosphate synthetic domain and the carbamoyl phosphate synthetic domain of carbamoyl phosphate synthetase is very similar to the binding of Mn2+ and AMPPNP in **phosphorylase kinase**. One challenge for the future is to understand how the **structure** of the active site of these enzymes leads to different products.

REFERENCE COUNT: 374 THERE ARE 374 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE

FORMAT

L43 ANSWER 8 OF 41 MEDLINE
ACCESSION NUMBER: 2000054436 MEDLINE
DOCUMENT NUMBER: 20054436 PubMed ID: 10585434
TITLE: Self-association of the alpha subunit of **phosphorylase kinase** as determined by two-hybrid screening.
AUTHOR: Ayers N A; Wilkinson D A; Fitzgerald T J; Carlson G M
CORPORATE SOURCE: Division of Molecular Biology, School of Biological Sciences, University of Missouri, Kansas City, Missouri 64110-2499, USA.
CONTRACT NUMBER: DK32953 (NIDDK)
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (1999 Dec 10) 274 (50) 35583-90.
Journal code: HIV; 2985121R. ISSN: 0021-9258.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200001
ENTRY DATE: Entered STN: 20000124
Last Updated on STN: 20000124
Entered Medline: 20000113

AB The **structural** organization of the (alphabetagammadelta)(4) **phosphorylase kinase** complex has been studied using the yeast two-hybrid screen for the purpose of elucidating regions of alpha subunit interactions. By screening a rabbit skeletal muscle cDNA library with residues 1-1059 of the alpha subunit of **phosphorylase kinase**, we have isolated 16 interacting, independent, yet overlapping transcripts of the alpha subunit containing its C-terminal region. Domain mapping of binary interactions between alpha constructs revealed two regions involved in the self-association of the alpha subunit: residues 833-854, a previously unrecognized leucine zipper, and an unspecified region within residues 1015-1237. The cognate binding partner for the latter domain has been inferred to lie within the stretch from residues 864-1059. Indirect evidence from the literature suggests that the interacting domains contained within the latter two, overlapping regions may be further narrowed to the stretches from 1057 to 1237 and from 864 to 971. Cross-linking of the nonactivated holoenzyme with N-(gamma-maleimidobutyroxy)sulfosuccin-imide ester produced intramolecularly cross-linked alpha-alpha dimers, consistent with portions of two alpha subunits in the holoenyzme being in sufficient proximity to associate. This is the first report to identify potential areas of contact between the alpha subunits of **phosphorylase kinase**. Additionally, issues regarding the general utility of two-hybrid screening as a method for studying homodimeric interactions are discussed.

L43 ANSWER 9 OF 41 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1999:352557 HCAPLUS
DOCUMENT NUMBER: 131:154296
TITLE: Genomic **structure** and comparative analysis of nine Fugu genes: conservation of synteny with human chromosome Xp22.2-p22.1
AUTHOR(S): Brunner, Bodo; Todt, Tilman; Lenzner, Steffen; Stout, Karen; Schulz, Ute; Ropers, Hans-Hilger; Kalscheuer, Vera M.
CORPORATE SOURCE: Max-Planck-Institute for Molecular Genetics, Berlin-Dahlem, D-14195, Germany
SOURCE: Genome Research (1999), 9(5), 437-448
CODEN: GEREFS; ISSN: 1088-9051
PUBLISHER: Cold Spring Harbor Laboratory Press

DOCUMENT TYPE: Journal
LANGUAGE: English
AB The puffer-fish Fugu rubripes has a compact 400-Mb genome that is -7.5 times smaller than the human genome but contains a similar no. of genes. Focusing on the distal short arm of the human X chromosome, we have studied the evolutionary conservation of gene orders in Fugu and man. Sequencing of 68 kb of Fugu genomic DNA identified nine genes: (SCML2)-STK9, XLRS1, PPEF-1, KELCH2, KELCH1, PHKA2, AP19, and U2AFI-RS2. Apart from an evolutionary inversion sepg. AP19 and U2AFI-RS2 from PHKA2, gene orders are identical in Fugu and man, and all nine human **homologs** map to the Xp22 band. All Fugu genes were found to be smaller than their human counterparts, but gene **structures** were mostly identical. These data suggest that genomic sequencing in Fugu is a powerful and economical strategy to predict gene orders in the human genome and to elucidate the **structure** of human genes.
REFERENCE COUNT: 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 10 OF 41 SCISEARCH COPYRIGHT 2002 ISI (R)
ACCESSION NUMBER: 1999:82131 SCISEARCH
THE GENUINE ARTICLE: 157QR
TITLE: Molecular mechanisms of calmodulin's functional versatility
AUTHOR: Zhang M J (Reprint); Yuan T
CORPORATE SOURCE: HONG KONG UNIV SCI & TECHNOL, DEPT BIOCHEM, CLEAR WATER BAY, HONG KONG, PEOPLES R CHINA (Reprint); UNIV CALGARY, DEPT BIOL SCI, CALGARY, AB T2N 1N4, CANADA
COUNTRY OF AUTHOR: PEOPLES R CHINA; CANADA
SOURCE: BIOCHEMISTRY AND CELL BIOLOGY-BIOCHIMIE ET BIOLOGIE CELLULAIRE, (10 DEC 1998) Vol. 76, No. 2-3, pp. 313-323. Publisher: NATL RESEARCH COUNCIL CANADA, RESEARCH JOURNALS, MONTREAL RD, OTTAWA ON K1A 0R6, CANADA. ISSN: 0829-8211.
DOCUMENT TYPE: General Review; Journal
FILE SEGMENT: LIFE
LANGUAGE: English
REFERENCE COUNT: 74
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS
AB Calmodulin (CaM) is a primary Ca2+-binding protein found in all eukaryotic cells. It couples the intracellular Ca2+ signal to many essential cellular events by binding and regulating the activities of more than 40 different proteins and enzymes in a Ca2+-dependent manner. CaM contains two **structurally** similar domains connected by a flexible central linker. Each domain of the protein binds two Ca2+ ions with positive cooperativity. The binding of Ca2+ transforms the protein into its active form through a reorientation of the existing helices of the protein. The two helices in each helix-loop-helix Ca2+-binding motif are almost antiparallel in Ca2+-free CaM. The binding of Ca2+ induces concerted helical pair movements and changes the two helices in each Ca2+ binding motif to a nearly perpendicular orientation. These concerted helix pair movements are accompanied by dramatic changes on the molecular surface of the protein. Rather than exhibiting a flat, hydrophilic molecular surface as seen in Ca2+-free CaM, the Ca2+-saturated form of the protein contains a Met-rich, cavity-containing hydrophobic surface in each domain. These hydrophobic surfaces are largely responsible for the binding of CaM to its targets. The unique flexibility and high polarizability of the Met residues located at the entrance of each hydrophobic pocket together with other hydrophobic amino acid residues create adjustable, sticky interaction surface areas that can accommodate CaM's targets, which have various sizes and shapes. Therefore, CaM is able to bind to a large array of targets without obvious sequence **homology**. Upon binding to its target peptides, the unwinding of the central linker allows the two

domains of the protein to engulf the hydrophobic face of target peptides of differing lengths. The binding of Ca2+ reduces the backbone flexibility of CaM. Formation of complexes with its target peptides further decreases the backbone motion of CaM.

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=> d his

     (FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
     LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002
L1          6113 S PHOSPHORYLASE (A) KINASE?
L2       1826592 S CALCIUM OR CALMODULIN
L3          1863 S L1 AND L2
L4       5404408 S CLON? OR EXPRESS? OR RECOMBINANT
L5           194 S L3 AND L4
L6       3195886 S PLANT? OR SEED?
L7        178637 S RICE OR ARYZA(A) SATIVA
L8             1 S L5 AND L7
L9             1 S L1 AND L7
                 E ALLEN S M/AU
L10          285 S E3
                 E LEE J M/AU
L11         2739 S E3
L12         3022 S L10 OR L11
L13            0 S L1 AND L12
L14           18 S L7 AND L12
L15           17 DUP REM L14 (1 DUPLICATE REMOVED)
L16       969695 S KINASE?
L17            2 S L15 AND L16
L18            0 S L3 AND L12
L19           56 S L2 AND L12
L20            3 S L19 AND L16
L21            5 S "CALCIUM DEPENDENT PHOSPHORYLASE KINASE?"
L22            1 S L21 AND L7
L23            1 S L1 AND L7
L24            1 S L21 AND L6
L25      1725731 S SUBSTRATE? OR GLYCOGEN(A) PHOSPHORYLASE?
L26         1900 S L25 AND L1
L27            1 S L7 AND L26
L28         1789 S "CALCIUM DEPENDENT PROTEIN KINASE?"
L29           13 S L1 AND L28
L30           11 DUP REM L29 (2 DUPLICATES REMOVED)
L31         1745 S (L28 OR L1) AND SUBSTRATE?
L32          491 S L28 AND SUBSTRATE?
L33         1259 S L1 AND SUBSTRATE?
L34          203 S L32 AND PLANT?
L35           16 S L33 AND PLANT?
L36            9 DUP REM L35 (7 DUPLICATES REMOVED)
L37            1 S L36 AND L28
L38            5 S L32 AND L33
L39           13 S L1 AND L28
L40           11 DUP REM L39 (2 DUPLICATES REMOVED)
L41          210 S  L1 AND HOMOLOG?
L42           92 S L41 AND STRUCTUR?
L43           41 DUP REM L42 (51 DUPLICATES REMOVED)

=> s l43 and subunit?
L44           27 L43 AND SUBUNIT?

=> d 1-27 ibib ab
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L44 ANSWER 1 OF 27 MEDLINE
ACCESSION NUMBER: 2000481058 MEDLINE
DOCUMENT NUMBER: 20431384 PubMed ID: 10976872
TITLE: Activation of calcium/calmodulin regulated kinases.
AUTHOR: Wilmann M; Gautel M; Mayans O
CORPORATE SOURCE: EMBL, Hamburg, Germany.. wilmanns@embl-hamburg.de
SOURCE: CELLULAR AND MOLECULAR BIOLOGY, (2000 Jul) 46 (5) 883-94.
Journal code: BNA; 9216789. ISSN: 0145-5680.
PUB. COUNTRY: France
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200010
ENTRY DATE: Entered STN: 20001019
Last Updated on STN: 20001019
Entered Medline: 20001012

AB Among numerous protein kinases found in mammalian cell systems there is a distinct subfamily of serine/threonine kinases that are regulated by calmodulin or other related activators in a calcium concentration dependent manner. Members of this family are involved in various cellular processes like cell proliferation and death, cell motility and metabolic pathways. In this contribution we shall review the available **structural** biology data on five members of this kinase family (calcium/calmodulin dependent kinase, twitchin kinase, titin **kinase, phosphorylase kinase,** myosin light chain kinase). As a common element, all these kinases contain a regulatory tail, which is C-terminal to their catalytic domain. The available 3D **structures** of two members, the serine/threonine kinases of the giant muscle proteins twitchin and titin in the autoinhibited conformation, show how this regulatory tail blocks their active sites. The **structures** suggest that activation of these kinases requires unblocking the active site from the C-terminal extension and conformational rearrangement of the active site loops. Small angle scattering data for myosin light chain kinase indicate a complete release of the C-terminal extension upon calcium/calmodulin binding. In addition, members of this family are regulated by diverse add-on mechanisms, including phosphorylation of residues within the activation segment or the P+1 loop as well as by additional regulatory **subunits**. The available **structural** data lead to the hypothesis of two different activation mechanisms upon binding to calcium sensitive proteins. In one model, the regulatory tail is entirely released ("fall-apart"). The alternative model ("looping-out") proposes a two-anchored release mechanism.

L44 ANSWER 2 OF 27 MEDLINE
ACCESSION NUMBER: 2000054436 MEDLINE
DOCUMENT NUMBER: 20054436 PubMed ID: 10585434
TITLE: Self-association of the alpha **subunit** of **phosphorylase kinase** as determined by two-hybrid screening.
AUTHOR: Ayers N A; Wilkinson D A; Fitzgerald T J; Carlson G M
CORPORATE SOURCE: Division of Molecular Biology, School of Biological Sciences, University of Missouri, Kansas City, Missouri 64110-2499, USA.
CONTRACT NUMBER: DK32953 (NIDDK)
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (1999 Dec 10) 274 (50) 35583-90.
Journal code: HIV; 2985121R. ISSN: 0021-9258.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English

FILE SEGMENT: Priority Journals
ENTRY MONTH: 200001
ENTRY DATE: Entered STN: 20000124
Last Updated on STN: 20000124
Entered Medline: 20000113

AB The **structural** organization of the (alphabetagammadelta)(4) **phosphorylase kinase** complex has been studied using the yeast two-hybrid screen for the purpose of elucidating regions of alpha **subunit** interactions. By screening a rabbit skeletal muscle cDNA library with residues 1-1059 of the alpha **subunit** of **phosphorylase kinase**, we have isolated 16 interacting, independent, yet overlapping transcripts of the alpha **subunit** containing its C-terminal region. Domain mapping of binary interactions between alpha constructs revealed two regions involved in the self-association of the alpha **subunit**: residues 833-854, a previously unrecognized leucine zipper, and an unspecified region within residues 1015-1237. The cognate binding partner for the latter domain has been inferred to lie within the stretch from residues 864-1059. Indirect evidence from the literature suggests that the interacting domains contained within the latter two, overlapping regions may be further narrowed to the stretches from 1057 to 1237 and from 864 to 971. Cross-linking of the nonactivated holoenzyme with N-(gamma-maleimidobutyroxy)sulfosuccin-imide ester produced intramolecularly cross-linked alpha-alpha dimers, consistent with portions of two alpha **subunits** in the holoenyzme being in sufficient proximity to associate. This is the first report to identify potential areas of contact between the alpha **subunits** of **phosphorylase kinase**. Additionally, issues regarding the general utility of two-hybrid screening as a method for studying homodimeric interactions are discussed.

L44 ANSWER 3 OF 27 MEDLINE
ACCESSION NUMBER: 96283831 MEDLINE
DOCUMENT NUMBER: 96283831 PubMed ID: 8681948
TITLE: **Structure** of the human gene encoding the **phosphorylase kinase** beta **subunit** (PHKB).
AUTHOR: Wullrich-Schmoll A; Kilimann M W
CORPORATE SOURCE: Institut fur Physiologische Chemie, Medizinische Fakultat, Ruhr-Universitat Bochum, Germany.
SOURCE: EUROPEAN JOURNAL OF BIOCHEMISTRY, (1996 Jun 1) 238 (2) 374-80.
Journal code: EMZ; 0107600. ISSN: 0014-2956.
PUB. COUNTRY: GERMANY: Germany, Federal Republic of
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-X84908; GENBANK-X84909; GENBANK-X84910; GENBANK-X84911; GENBANK-X84912; GENBANK-X84913; GENBANK-X84914; GENBANK-X84915; GENBANK-X84916; GENBANK-X84917; GENBANK-X84918; GENBANK-X84919; GENBANK-X84920; GENBANK-X84921; GENBANK-X84922; GENBANK-X84923; GENBANK-X84924; GENBANK-X84925; GENBANK-X84926; GENBANK-X84927; GENBANK-X84928; GENBANK-X84929; GENBANK-X84930; GENBANK-X84931; GENBANK-X84932; GENBANK-X84933; GENBANK-X84934; GENBANK-X84935; GENBANK-X84936; GENBANK-X84937; +
ENTRY MONTH: 199608
ENTRY DATE: Entered STN: 19960828
Last Updated on STN: 19960828
Entered Medline: 19960822

AB We have determined the cDNA sequence and the gene **structure** of

the human **phosphorylase kinase** beta **subunit** (PHKB). With 95% amino acid sequence identity, the predicted primary **structure** is highly similar to that of the rabbit beta **subunit**. At least 140 kilonucleotides in length, the gene is large and consists of 33 exons. Exons 26 and 27 are two **homologous**, mutually exclusively spliced exons in the middle of the gene, and exon 2 is a facultatively utilized cassette exon encoding an alternative N-terminus of the beta **subunit**. The previous assignment of the PHKB gene to chromosome 16 is confirmed by the successful screening of a chromosome 16-specific genomic library. Plaque hybridization at reduced stringency led to the isolation of two processed pseudogenes, PHKBP1 and PHKBP2, but of no other PHKB-related sequences.

L44 ANSWER 4 OF 27 MEDLINE
ACCESSION NUMBER: 96057548 MEDLINE
DOCUMENT NUMBER: 96057548 PubMed ID: 7549948
TITLE: Isolation of cDNA encoding the human liver **phosphorylase kinase** alpha **subunit** (PHKA2) and identification of a missense mutation of the PHKA2 gene in a family with liver **phosphorylase kinase** deficiency.
AUTHOR: Hirono H; Hayasaka K; Sato W; Takahashi T; Takada G
CORPORATE SOURCE: Department of Pediatrics, Akita University School of Medicine, Japan.
SOURCE: BIOCHEMISTRY AND MOLECULAR BIOLOGY INTERNATIONAL, (1995 Jul) 36 (3) 505-11.
Journal code: BOD; 9306673. ISSN: 1039-9712.
PUB. COUNTRY: Australia
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-D38616
ENTRY MONTH: 199511
ENTRY DATE: Entered STN: 19951227
Last Updated on STN: 19951227
Entered Medline: 19951122

AB X-linked liver glycogenosis (XLG) due to liver **phosphorylase kinase** (PHK) deficiency is the most frequent liver glycogen storage disease. The affected patients present in early childhood with hepatomegaly and growth retardation. We isolated and determined the **structure** of human liver alpha **subunit** of PHK (PHKA2) cDNA. The 3705 base pair open reading frame encodes a polypeptide of 1235 amino acid residues, and the deduced amino acid sequence shows 93 and 68% **homology** to that of rabbit liver alpha **subunit** of PHK and human muscle alpha **subunit** of PHK, respectively. We identified a missense mutation, a valine substitution for glycine at amino acid 193, in the PHKA2 gene of a family with XLG.

L44 ANSWER 5 OF 27 MEDLINE
ACCESSION NUMBER: 95221368 MEDLINE
DOCUMENT NUMBER: 95221368 PubMed ID: 7706257
TITLE: Identification of the substrate and pseudosubstrate binding sites of **phosphorylase kinase** gamma-**subunit**.
AUTHOR: Huang C Y; Yuan C J; Blumenthal D K; Graves D J
CORPORATE SOURCE: Department of Biochemistry and Biophysics, Iowa State University, Ames 50011, USA.
CONTRACT NUMBER: GM-09587 (NIGMS)
GM-39290 (NIGMS)
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (1995 Mar 31) 270 (13) 7183-8.
Journal code: HIV; 2985121R. ISSN: 0021-9258.

PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199505
ENTRY DATE: Entered STN: 19950518
Last Updated on STN: 19970203
Entered Medline: 19950510

AB Using site-directed mutagenesis, we proposed that an autoinhibitory domain(s) is located at the C-terminal region (301-386) of the **phosphorylase kinase** gamma-**subunit** (Huang, C.-Y.F., Yuan C.-J., Livanova, N.B., and Graves, D.J. (1993) Mol. Cell. Biochem. 127/128, 7-18). Removal of the putative inhibitory domain(s) by truncation results in the generation of a constitutively active and calmodulin-independent form, gamma 1-300. To probe the **structural** basis of autoinhibition of gamma-**subunit** activity, two synthetic peptides, PhK13 (gamma 303-327) and PhK5 (gamma 343-367), corresponding to the two calmodulin-binding regions, were assayed for their ability to inhibit gamma 1-300. Competitive inhibition of gamma 1-300 by PhK13 was found versus phosphorylase b (Ki = 1.8 microM) and noncompetitive inhibition versus ATP. PhK5 showed noncompetitive inhibition with respect to both phosphorylase b and ATP. Calmodulin released the inhibition caused by both peptides. These results indicate that there are two distinct auto-inhibitory domains within the C terminus of the gamma-**subunit** and that these two domains overlap with the calmodulin-binding regions. Two mutant forms of gamma 1-300, E111K and E154R, were used to probe the enzyme-substrate-binding region using peptide substrate analogs corresponding to residues 9-18 of phosphorylase b (KRK11Q12ISVRGL). The data suggest that Glu111 interacts with the P-3 position of the substrate (Lys11) and Glu154 interacts with the P-2 site (Gln12). Both E111K and E154R were competitively inhibited with respect to phosphorylase b by PhK13, with 14- and 8-fold higher Ki values, respectively, than that observed with the wild-type enzyme. These data are consistent with a model for the regulation of the gamma-**subunit** of **phosphorylase kinase** in which PhK13 acts as a competitive pseudosubstrate that directly binds the substrate binding site of the gamma-**subunit** (Glu111 and Glu154).

L44 ANSWER 6 OF 27 MEDLINE
ACCESSION NUMBER: 94153583 MEDLINE
DOCUMENT NUMBER: 94153583 PubMed ID: 8110484
TITLE: Two exons encode the calmodulin-binding domain in the mouse **phosphorylase kinase** catalytic **subunit** gene.
AUTHOR: Bender P K; Wang Z; Carlson G M
CORPORATE SOURCE: Department of Biochemistry and Nutrition, Virginia Polytechnic Institute, Blacksburg 24061.
SOURCE: GENETIC ANALYSIS, TECHNIQUES AND APPLICATIONS, (1993 Jun-Aug) 10 (3-4) 99-101.
Journal code: AP4; 9004550. ISSN: 1050-3862.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-L10999; GENBANK-L24529; GENBANK-S53924; GENBANK-S54934; GENBANK-S54935; GENBANK-S54936; GENBANK-S54938; GENBANK-S54941; GENBANK-Z15047; GENBANK-Z15048
ENTRY MONTH: 199403
ENTRY DATE: Entered STN: 19940406
Last Updated on STN: 19950206
Entered Medline: 19940330

AB The catalytic **subunit**, gamma, of **phosphorylase kinase** contains two calmodulin-binding sequences that define a domain in gamma that is **homologous** to the troponin-C-binding domain in troponin I. The **homology** is based on both sequence and functional similarities. To account for this **homology**, it has been proposed that the calmodulin-binding sequences in gamma and the troponin-C-binding domain in troponin I have evolved from a common ancestor. We investigated this possibility by comparing the exon **structure** of the gamma gene with that of troponin-I gene over their **homologous** domains. In the quail troponin-I gene, it is known that the entire troponin-C-binding domain is encoded by a single exon. However, two exons are found to encode the calmodulin-binding domain in the gamma gene from mouse. This result indicates that convergent evolution may be responsible for the sequence and functional similarities between the **homologous** domains in troponin I and gamma.

L44 ANSWER 7 OF 27 MEDLINE
ACCESSION NUMBER: 94043107 MEDLINE
DOCUMENT NUMBER: 94043107 PubMed ID: 8226841
TITLE: The multiphosphorylation domain of the **phosphorylase kinase** alpha M and alpha L **subunits** is a hotspot of differential mRNA processing and of molecular evolution.
AUTHOR: Wullrich A; Hamacher C; Schneider A; Kilimann M W
CORPORATE SOURCE: Institut fur Physiologische Chemie, Ruhr-Universitat Bochum, Federal Republic of Germany.
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (1993 Nov 5) 268 (31) 23208-14.
Journal code: HIV; 2985121R. ISSN: 0021-9258.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-X73874; GENBANK-X73875; GENBANK-X73876
ENTRY MONTH: 199311
ENTRY DATE: Entered STN: 19940117
Last Updated on STN: 19940117
Entered Medline: 19931129

AB We have cloned and sequenced human cDNAs encoding the complete **phosphorylase kinase** alpha **subunit** muscle isoform (alpha M). The predicted polypeptide is highly similar to the sequence known from rabbit muscle but lacks a major part of its multiphosphorylation domain, including the main phosphorylation site for cAMP-dependent protein kinase (PKA). Analysis of this region by reverse-transcribed polymerase chain reaction (RT-PCR) in several human and rabbit tissues demonstrates that it is subject to elaborate differential mRNA splicing. Amino acids 1012-1024 of the full-length rabbit sequence, including the major PKA phosphorylation site, and amino acids 1025-1041, which harbor at least one endogenous phosphorylation site, can be deleted from the predicted polypeptide individually or in combination. Molecules lacking one or both of these segments constitute a major part of the alpha M **subunit** population in many rabbit tissues and constitute the vast majority in all human tissues analyzed. Similar, tissue-dependent differential splicing events could be detected by RT-PCR in the human alpha **subunit** isoform from liver (alpha L). The expression of the differentially spliced alpha M subtypes differs markedly between corresponding human and rabbit tissues. Sequence divergence in this region is particularly high, not only between the muscle and liver isoforms, but also between alpha M sequences from four different animal species. Moreover, a duplication of the exon encoding the main PKA phosphorylation site was discovered in the mouse. Thus, the multiphosphorylation domain of the **phosphorylase kinase**

alpha **subunit** isoforms is subject to pronounced **structural** variation not only between different tissues of one organism via differential splicing, but also in the course of evolution.

L44 ANSWER 8 OF 27 MEDLINE
ACCESSION NUMBER: 93123233 MEDLINE
DOCUMENT NUMBER: 93123233 PubMed ID: 8419323
TITLE: Characterization of the gene for rat **phosphorylase kinase** catalytic **subunit**.
AUTHOR: Cawley K C; Akita C G; Angelos K L; Walsh D A
CORPORATE SOURCE: Department of Biological Chemistry, School of Medicine, University of California, Davis 95616.
CONTRACT NUMBER: DK13613 (NIDDK)
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (1993 Jan 15) 268 (2) 1194-200.
Journal code: HIV; 2985121R. ISSN: 0021-9258.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-M98826; GENBANK-M98827
ENTRY MONTH: 199302
ENTRY DATE: Entered STN: 19930226
Last Updated on STN: 19930226
Entered Medline: 19930205

AB **Phosphorylase kinase**, a key enzyme in glycogen metabolism, has a **subunit** composition of (alpha beta gamma delta)4, in which the alpha and beta **subunits** are regulatory, delta is calmodulin, and the gamma **subunit** is catalytic. As one segment of our studies on the regulation of the expression of **phosphorylase kinase subunits**, we present in this report the **structure** of the gene for the catalytic gamma **subunit**. The gene extends over 16 kilobase pairs (kb) of DNA, and contains eight introns within the coding region plus one 3.3-kb intron upstream in the 5'-untranslated region. Within this first intron, and also upstream of the transcription start site, are sequences **homologous** to defined regulatory elements, including some found in other muscle-specific genes. The positions of intron splice junctions for this gene have been compared with similar data for other protein kinase genes. A somewhat unexpected finding for the gamma **subunit** is that two of the splice junctions fall in the midst of highly conserved strings of amino acids, both of which have been nominally defined as functional domains for the protein kinases and appear to make key contributions to substrate binding and phosphotransferase catalysis.

L44 ANSWER 9 OF 27 MEDLINE
ACCESSION NUMBER: 92196064 MEDLINE
DOCUMENT NUMBER: 92196064 PubMed ID: 1372435
TITLE: cDNA cloning of a liver isoform of the **phosphorylase kinase** alpha **subunit** and mapping of the gene to Xp22.2-p22.1, the region of human X-linked liver glycogenosis.
AUTHOR: Davidson J J; Ozcelik T; Hamacher C; Willems P J; Francke U; Kilimann M W
CORPORATE SOURCE: Institut fur Physiologische Chemie, Ruhr-Universitat Bochum, Germany.
SOURCE: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, (1992 Mar 15) 89 (6) 2096-100.
Journal code: PV3; 7505876. ISSN: 0027-8424.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English

FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-X60421
ENTRY MONTH: 199204
ENTRY DATE: Entered STN: 19920509
Last Updated on STN: 19960129
Entered Medline: 19920417

AB We have cloned cDNA molecules encoding another isoform of the alpha **subunit** of **phosphorylase kinase** (ATP:phosphorylase-b phosphotransferase, EC 2.7.1.38). Sequence comparison with the previously characterized muscle isoform reveals a pattern of highly conserved and variable domains and demonstrates that the isoforms are the products of distinct genes. In contrast to the muscle isoform gene, PHKA1, the gene of this additional isoform, PHKA2, is predominantly expressed in liver and other nonmuscle tissues. It was mapped to the distal short arm of the human X chromosome (Xp22.2-p22.1), the same region to which human X-linked liver glycogenosis due to **phosphorylase kinase** deficiency has been mapped. Thus, X-linked liver glycogenosis is probably caused by mutations affecting PHKA2.

L44 ANSWER 10 OF 27 MEDLINE
ACCESSION NUMBER: 92112855 MEDLINE
DOCUMENT NUMBER: 92112855 PubMed ID: 1370475
TITLE: Molecular cloning and enzymatic analysis of the rat **homolog** of "PhK-gamma T," an isoform of **phosphorylase kinase** catalytic **subunit**.
AUTHOR: Calalb M B; Fox D T; Hanks S K
CORPORATE SOURCE: Department of Cell Biology, Vanderbilt University School of Medicine, Nashville, Tennessee 37232.
CONTRACT NUMBER: GM-38793 (NIGMS)
RR-05424 (NCRR)
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (1992 Jan 25) 267 (3) 1455-63.
Journal code: HIV; 2985121R. ISSN: 0021-9258.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-L08495; GENBANK-M63383; GENBANK-M73808; GENBANK-M86615; GENBANK-M86616; GENBANK-M86617; GENBANK-M86618; GENBANK-M86619; GENBANK-M86620; GENBANK-X62322
ENTRY MONTH: 199202
ENTRY DATE: Entered STN: 19920308
Last Updated on STN: 19970203
Entered Medline: 19920218

AB Messenger RNA encoding a protein kinase closely related to the catalytic **subunit** of skeletal muscle **phosphorylase kinase** has previously been isolated from a human HeLa cell cDNA library, and cross-species Northern hybridization analysis has shown that the rat **homolog** of this transcript is abundant in the adult testis (Hanks, S.K. (1989) Mol. Endocrinol. 3, 110-116). We now propose that the protein encoded by this transcript be designated as "PhK-gamma T." In this article, the primary **structure** of the rat **homolog** of PhK-gamma T is described, as deduced from nucleotide sequences of cDNA and genomic clones. RNase protection analysis reveals that PhK-gamma T transcripts are actually present in a wide variety of adult rat tissues, but at levels 20-100-fold less than what is observed in the testis. In the testis, transcription of the PhK-gamma T gene is initiated at multiple sites as shown by RNase protection and primer extension. Enzymatic activity of PhK-gamma T was demonstrated using renatured bacterially expressed protein. In the presence of Ca2+/calmodulin, PhK-gamma T is able

to efficiently phosphorylate glycogen phosphorylase and convert it from an inactive to an active form. We conclude that PhK-gamma T represents a true isoform of **phosphorylase kinase** catalytic **subunit**.

L44 ANSWER 11 OF 27 MEDLINE
ACCESSION NUMBER: 91093149 MEDLINE
DOCUMENT NUMBER: 91093149 PubMed ID: 1845967
TITLE: Calmodulin-binding proteins also have a calmodulin-like binding site within their **structure**. The flip-flop model.
AUTHOR: Jarrett H W; Madhavan R
CORPORATE SOURCE: Department of Biochemistry, University of Tennessee, Memphis 38163.
CONTRACT NUMBER: GM 43609 (NIGMS)
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (1991 Jan 5) 266 (1) 362-71.
Journal code: HIV; 2985121R. ISSN: 0021-9258.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199102
ENTRY DATE: Entered STN: 19910322
Last Updated on STN: 19980206
Entered Medline: 19910214

AB The flip-flop model is a mechanistic model proposed to describe how calmodulin activates enzymes. One prediction based upon this model is that calmodulin-activated enzymes would contain a calmodulin-like binding site which, among other attributes, would bind the peptide melittin. Five purified calmodulin-activated enzymes, namely calcineurin, myosin light chain **kinase**, **phosphorylase** b kinase, phosphodiesterase, and NAD kinase, were all found to bind biotinylated melittin and to also bind an antimelittin antibody and biotinylated calmodulins. Using gel blots of crude tissue extracts (rat brain and Arabidopsis), most proteins did not bind any of the probes and thus do not have these characteristics. However, among those which bind any of these probes, a strong correlation was found between those proteins which bind biotinylated calmodulins and those which bind melittin and antimelittin. Gel blots of phosphorylase b kinase demonstrate that the alpha, beta, and gamma **subunits** all bind calmodulin and melittin. A putative calmodulin-like binding site sequence was identified in eight enzymes or **subunits** which may play an important role in both melittin binding and calmodulin-dependent regulation of these enzymes.

L44 ANSWER 12 OF 27 MEDLINE
ACCESSION NUMBER: 91032193 MEDLINE
DOCUMENT NUMBER: 91032193 PubMed ID: 1699810
TITLE: cDNA encoding a 59 kDa **homolog** of ribosomal protein S6 kinase from rabbit liver.
AUTHOR: Harmann B; Kilimann M W
CORPORATE SOURCE: Institut fur Physiologische Chemie, Abteilung fur Biochemie Supramolekularer Systeme, Ruhr-Universitat Bochum, FRG.
SOURCE: FEBS LETTERS, (1990 Oct 29) 273 (1-2) 248-52.
Journal code: EUH; 0155157. ISSN: 0014-5793.
PUB. COUNTRY: Netherlands
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-X54415
ENTRY MONTH: 199012
ENTRY DATE: Entered STN: 19910208

Last Updated on STN: 19980206
Entered Medline: 19901213

AB We have isolated cDNA molecules encoding a protein with the characteristic sequence elements that are conserved between the catalytic domains of protein kinases. This protein is apparently a serine/threonine kinase and is most closely related to the amino-terminal half of the ribosomal protein S6 kinase II first characterized in Xenopus eggs (42% overall identity and 56% identity in the predicted catalytic domain). However, it clearly differs from S6 kinase II in that it has only one, rather than two predicted catalytic domains and a deduced molecular mass of 59,109 Da. We propose that is may be more related to, or identical, with, the mitogen-inducible S6 kinase of molecular mass 65-70 kDa described in mammalian liver, mouse 3T3 cells and chicken embryos. Remarkable **structural** features of the cDNA-encoded polypeptide are a section rich in proline, serine and threonine residues that resemble the multiphosphorylation domains of glycogen synthase and **phosphorylase kinase** alpha **subunit**, and a characteristic tyrosine residue in the putative nucleotide-binding glycine cluster which, by analogy to cdc2 kinase, is a potential tyrosine phosphorylation site.

L44 ANSWER 13 OF 27 MEDLINE
ACCESSION NUMBER: 90384992 MEDLINE
DOCUMENT NUMBER: 90384992 PubMed ID: 2402508
TITLE: Functional and **structural** similarities between the inhibitory region of troponin I coded by exon VII and the calmodulin-binding regulatory region of the catalytic **subunit** of **phosphorylase kinase**
.
AUTHOR: Paudel H K; Carlson G M
CORPORATE SOURCE: Department of Biochemistry, College of Medicine, University of Tennessee, Memphis 38163.
CONTRACT NUMBER: DK 32953 (NIDDK)
SOURCE: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, (1990 Sep) 87 (18) 7285-9.
Journal code: PV3; 7505876. ISSN: 0027-8424.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199010
ENTRY DATE: Entered STN: 19901122
Last Updated on STN: 19970203
Entered Medline: 19901024

AB A sequence **homology** has been noted between the carboxyl quarter of the catalytic gamma **subunit** of **phosphorylase kinase** and the region of troponin I coded by exon VII. Because this portion of troponin I contains the inhibitory region that interacts with actin and troponin C, we have examined whether the gamma **subunit** of **phosphorylase kinase** can functionally mimic troponin I by also interacting with actin and troponin C. We have found that troponin C not only activates the isolated gamma **subunit** of **phosphorylase kinase** but also binds with approximately the same affinity as calmodulin. Although actin had no effect on the activity of the gamma **subunit** alone, it did inhibit the activity of gamma-calmodulin and gamma-troponin C complexes. Conversely, the gamma **subunit** was able to inhibit actomyosin ATPase in a process that could be overcome by calmodulin. These results suggest that actin and calmodulin (or troponin C) compete for binding to the gamma **subunit**. Moreover, the **structural** and functional similarities between the gamma **subunit** and troponin I suggest that the gamma **subunit** of **phosphorylase**

kinase may have evolved from the fusion of a protein kinase protogene with a progenitor of exon VII of troponin I.

L44 ANSWER 14 OF 27 MEDLINE
ACCESSION NUMBER: 89127266 MEDLINE
DOCUMENT NUMBER: 89127266 PubMed ID: 2915644
TITLE: Messenger ribonucleic acid encoding an apparent isoform of **phosphorylase kinase** catalytic **subunit** is abundant in the adult testis.
AUTHOR: Hanks S K
CORPORATE SOURCE: Molecular Biology Laboratory, Salk Institute for Biological Studies, San Diego, California 92138.
CONTRACT NUMBER: GM-38793 (NIGMS)
SOURCE: MOLECULAR ENDOCRINOLOGY, (1989 Jan) 3 (1) 110-6.
Journal code: NGZ; 8801431. ISSN: 0888-8809.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 198903
ENTRY DATE: Entered STN: 19900308
Last Updated on STN: 19970203
Entered Medline: 19890317

AB The complete amino acid sequence for a novel member of the protein kinase family was deduced from the nucleotide sequence of a cloned human cDNA. This putative protein kinase, given the preliminary designation "PSK-C3," is similar in primary **structure** to **phosphorylase kinase** catalytic **subunit** (PhK-gamma) isolated from rabbit skeletal muscle. The level of similarity does not appear sufficient, however, to suggest that PSK-C3 represents the human **homolog** of skeletal muscle PhK-gamma. Rather, it seems likely that PSK-C3 is a novel PhK-gamma isoform. From a cross-species Northern hybridization experiment using adult rat tissue RNA, a transcript **homologous** to PSK-C3 was found to be abundant in the testis but could not be detected in any of 12 other tissues tested, including skeletal muscle, liver, and ovary. Increasing levels of PSK-C3 mRNA in the testis correlate with postnatal testicular development, suggesting possible hormonal regulation of gene transcription. Energy released by glycogeneolysis in the testis may help fuel the process of spermatogenesis.

L44 ANSWER 15 OF 27 MEDLINE
ACCESSION NUMBER: 89071702 MEDLINE
DOCUMENT NUMBER: 89071702 PubMed ID: 3200826
TITLE: The alpha and beta **subunits** of **phosphorylase kinase** are **homologous**: cDNA cloning and primary **structure** of the beta **subunit**.
AUTHOR: Kilimann M W; Zander N F; Kuhn C C; Crabb J W; Meyer H E; Heilmeyer L M Jr
CORPORATE SOURCE: Institut fur Physiologische Chemie, Ruhr-Universitat Bochum, Federal Republic of Germany.
CONTRACT NUMBER: CA-37589 (NCI)
EY-06603 (NEI)
SOURCE: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, (1988 Dec) 85 (24) 9381-5.
Journal code: PV3; 7505876. ISSN: 0027-8424.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-J04120; PIR-UNKNOWN

ENTRY MONTH: 198901
ENTRY DATE: Entered STN: 19900308
Last Updated on STN: 19970203
Entered Medline: 19890126

AB We have cloned cDNA molecules encoding the beta **subunit** of **phosphorylase kinase** (ATP:phosphorylase-b phosphotransferase; EC 2.7.1.38) from rabbit fast-twitch skeletal muscle and have determined the complete primary **structure** of the polypeptide by a combination of peptide and DNA sequencing. In the mature beta **subunit**, the initial methionine is replaced by an acetyl group. The **subunit** is composed of 1092 amino acids and has a calculated molecular mass of 125,205 Da. Alignment of its sequence with the alpha **subunit** of **phosphorylase kinase** reveals extensive regions of **homology**, but each molecule also possesses unique sequences. Two of the three phosphorylation sites known for the beta **subunit** and all seven phosphorylation sites known for the alpha **subunit** are located in these unique domains.

L44 ANSWER 16 OF 27 MEDLINE
ACCESSION NUMBER: 87250504 MEDLINE
DOCUMENT NUMBER: 87250504 PubMed ID: 3597394
TITLE: Skeletal muscle **phosphorylase kinase** catalytic **subunit** mRNAs are expressed in heart tissue but not in liver.
AUTHOR: Bender P K; Emerson C P Jr
CONTRACT NUMBER: AM22125 (NIADDK)
AM34213 (NIADDK)
DK34213 (NIDDK)
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (1987 Jun 25) 262 (18) 8799-805.
Journal code: HIV; 2985121R. ISSN: 0021-9258.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-J02731; GENBANK-J03293
ENTRY MONTH: 198707
ENTRY DATE: Entered STN: 19900305
Last Updated on STN: 19970203
Entered Medline: 19870729

AB A cDNA encoding the skeletal muscle **phosphorylase kinase** catalytic **subunit** gamma has been isolated and sequenced. It contains 57 nucleotides of 5' nontranslated sequence, the entire coding sequence, and 1004 nucleotides of 3' nontranslated sequence. Probes derived from this gamma-cDNA were used to investigate the expression of gamma-messages in liver, heart, and skeletal muscle tissues. The results demonstrate that the gamma-mRNAs expressed in heart tissue are **homologous** to the skeletal muscle gamma-mRNAs. However, in liver tissue, no **homologous** gamma-mRNAs were detected. The implications of these results for understanding gamma-isoform expression and the possibility of a liver-specific gamma-gene are discussed.

L44 ANSWER 17 OF 27 MEDLINE
ACCESSION NUMBER: 87092414 MEDLINE
DOCUMENT NUMBER: 87092414 PubMed ID: 2948189
TITLE: **Homology** probing: identification of cDNA clones encoding members of the protein-serine kinase family.
AUTHOR: Hanks S K
CONTRACT NUMBER: GM09391 (NIGMS)
SOURCE: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, (1987 Jan) 84 (2) 388-92.
Journal code: PV3; 7505876. ISSN: 0027-8424.

PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-M14503; GENBANK-M14504; GENBANK-M14505
ENTRY MONTH: 198702
ENTRY DATE: Entered STN: 19900302
Last Updated on STN: 19970203
Entered Medline: 19870219

AB Mixed oligonucleotide probes were used to screen a HeLa cDNA library for clones encoding amino acid contiguities whose conservation is characteristic of the protein-serine kinase family. Eighty thousand clones were screened, from which 19 were identified as showing strong hybridization to two distinct probes. Four clones were chosen for characterization by partial DNA sequence analysis and 3 of these were found to encode amino acid sequences typical of protein-serine kinases. One deduced amino acid sequence shares 72% identity with rabbit skeletal muscle **phosphorylase kinase** gamma-**subunit**, while another is closely related to the yeast protein-serine kinases CDC2 in Schizosaccharomyces pombe and CDC28 in Saccharomyces cerevisiae. This screening approach should have applications in the identification of clones encoding previously unknown or poorly characterized members of other protein families.

L44 ANSWER 18 OF 27 MEDLINE
ACCESSION NUMBER: 85023304 MEDLINE
DOCUMENT NUMBER: 85023304 PubMed ID: 6541504
TITLE: **Homology** of the gamma **subunit** of phosphorylase b kinase with cAMP-dependent protein kinase.
AUTHOR: Reimann E M; Titani K; Ericsson L H; Wade R D; Fischer E H; Walsh K A
CONTRACT NUMBER: AM 07902 (NIADDK)
AM 19231 (NIADDK)
GM 15731 (NIGMS)
+
SOURCE: BIOCHEMISTRY, (1984 Aug 28) 23 (18) 4185-92.
Journal code: A0G; 0370623. ISSN: 0006-2960.
PUB. COUNTRY: United States
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 198412
ENTRY DATE: Entered STN: 19900320
Last Updated on STN: 19970203
Entered Medline: 19841212

AB The complete amino acid sequence of the catalytic **subunit** (gamma **subunit**) of rabbit skeletal muscle phosphorylase b kinase was determined. The gamma **subunit** was purified by gel filtration in acidic 8 M urea after reduction and S-carboxymethylation in 7 M guanidine hydrochloride. Cleavage of the gamma **subunit** at arginyl bonds gave a complete set of nonoverlapping peptides. Overlapping peptides were obtained by cleavage at methionyl, tryptophanyl, or glutamyl bonds and by selected subdigestion of two large peptides obtained by cleavage at methionyl bonds. Sequence analysis established that the protein contains 386 residues corresponding to a molecular weight (Mr) of 44673. Comparison of the gamma **subunit** with the catalytic **subunit** of bovine cAMP-dependent protein kinase and with tyrosine-specific kinases of viral origin revealed a significant degree of sequence identity among all of these proteins. These data suggest that calcium-dependent protein kinases may share a common ancestral gene and a common **structural** basis for catalytic function with a wide variety of other protein kinases which respond to different signals and control quite different processes.

L44 ANSWER 19 OF 27 MEDLINE
ACCESSION NUMBER: 84182572 MEDLINE
DOCUMENT NUMBER: 84182572 PubMed ID: 6325182
TITLE: ATP analog specificity of cAMP-dependent protein kinase, cGMP-dependent protein kinase, and **phosphorylase kinase**.
AUTHOR: Flockhart D A; Freist W; Hoppe J; Lincoln T M; Corbin J D
CONTRACT NUMBER: AM 15988 (NIADDK)
SOURCE: EUROPEAN JOURNAL OF BIOCHEMISTRY, (1984 Apr 16) 140 (2) 289-95.
Journal code: EMZ; 0107600. ISSN: 0014-2956.
PUB. COUNTRY: GERMANY, WEST: Germany, Federal Republic of
Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 198406
ENTRY DATE: Entered STN: 19900319
Last Updated on STN: 19970203
Entered Medline: 19840607

AB The ATP analog specificities of the homogeneous cGMP-dependent protein kinase and the catalytic **subunit** of cAMP-dependent protein kinase have been compared by the ability of 27 analogs to compete with ATP in the protein kinase reaction. Although the data suggest general similarities between the ATP sites of the two **homologous** cyclic-nucleotide-dependent protein kinases, specific differences especially in the adenine binding pocket are indicated. These differences in affinity suggest potentially useful ATP analog inhibitors of each kinase. For example, apparent autophosphorylation of the purified regulatory **subunit** of the cAMP-dependent protein kinase is blocked by nebularin triphosphate, suggesting that the phosphorylation is catalyzed by trace contamination of cGMP-dependent protein kinase. Some of the ATP analogs have also been tested using phosphorylase b kinase in order to compare this enzyme with the cyclic-nucleotide-dependent enzymes. All three protein kinases have high specificity for the purine moiety of ATP, and lower specificity for the ribose or triphosphate. The similarity between the ATP site of phosphorylase b kinase to that of the cyclic-nucleotide-dependent protein kinases suggests that it is related to them. The ATP analog specificities of enzymes examined in this study are different from those reported for several unrelated ATP-utilizing enzymes.

L44 ANSWER 20 OF 27 EMBASE
ACCESSION NUMBER: 95086445 EMBASE
DOCUMENT NUMBER: 1995086445
TITLE: Expression, purification and crystallisation of **phosphorylase kinase** catalytic domain.
AUTHOR: Owen D.J.; Papageorgiou A.C.; Garman E.F.; Noble M.E.M.; Johnson L.N.
CORPORATE SOURCE: Laboratory of Molecular Biophysics, Oxford Centre for Molecular Sciences, University of Oxford, South Parks Road,Oxford OX1 3QU, United Kingdom
SOURCE: Journal of Molecular Biology, (1995) 246/3 (374-381).
ISSN: 0022-2836 CODEN: JMOBAK
COUNTRY: United Kingdom
DOCUMENT TYPE: Journal; Article
FILE SEGMENT: 022 Human Genetics
029 Clinical Biochemistry
LANGUAGE: English
SUMMARY LANGUAGE: English

AB The catalytic **subunit** of **phosphorylase kinase** is composed of a kinase catalytic core domain (residues 1 to 298), which has a 33% identity with the kinase core of the cyclic AMP-dependent

protein kinase, and a C-terminal calmodulin binding domain. The kinase domain of the catalytic **subunit** has been expressed in Escherichia coli, purified and crystallised in the presence of ATP and magnesium from 5% (w/v) polyethylene glycol 8000, (C) (w/v) glycerol, 50 mM Hepes/NaOH (pH 6.9). A three-fold excess of magnesium to ATP was used for crystal growth. The inclusion of glycerol in the crystallization medium produced a marked reduction in mosaic spread of the diffraction spats from greater than 1.degree. to 0.3.degree.. The crystals are orthorhombic, space group P212121 With unit cell dimensions a=47.1 (8), b=69.1 .ANG., c=112.9 .ANG. and one molecule per asymmetric unit. Data to 3 W resolution have been collected and **structure** determination is in progress.

L44 ANSWER 21 OF 27 EMBASE COPYRIGHT 2002 ELSEVIER SCI. B.V.
ACCESSION NUMBER: 94378481 EMBASE
DOCUMENT NUMBER: 1994378481
TITLE: DPhK-.gamma., a putative Drosophila kinase with **homology** to vertebrate **phosphorylase kinase** .gamma. **subunits**: Molecular characterisation of the gene and phenotypic analysis of loss of function mutants.
AUTHOR: Bahri S.M.; Chia W.
CORPORATE SOURCE: Inst. Molecular and Cell Biology, National University of Singapore,Singapore 0511, Singapore
SOURCE: Molecular and General Genetics, (1994) 245/5 (588-597). ISSN: 0026-8925 CODEN: MGGEAE
COUNTRY: Germany
DOCUMENT TYPE: Journal; Article
FILE SEGMENT: 021 Developmental Biology and Teratology
022 Human Genetics
029 Clinical Biochemistry
LANGUAGE: English
SUMMARY LANGUAGE: English
AB Partial and total loss of function mutant alleles of a putative Drosophila **homologue** (DPhK-.gamma.) of the vertebrate **phosphorylase kinase** .gamma.-**subunit** gene have been isolated. DPhK-.gamma. is required in early embryonic processes, such as gastrulation and mesoderm formation; however, defects in these processes are seen only when both the maternal and zygotic components of DPhK-.gamma. expression are eliminated. Loss of zygotic expression alone does not appear to affect normal embryonic and larval development; some pupal lethality is observed but the majority of mutant animals eclose as adults. Many of these adults show defects in their leg musculature (e.g, missing and degenerating muscles), in addition to exhibiting melanised 'tumours' on their leg joints. Loss of only the maternal component has no obvious phenotypic consequences. The DPhK-.gamma. gene has been cloned and sequenced. It has an open reading frame (ORF) of 1680 bp encoding a 560 amino acid protein. The predicted amino acid sequence of DPhK-.gamma. has two conserved domains, the catalytic kinase and calmodulin-binding domains, separated by a linker sequence. The amino acid sequence of DPhK-.gamma. is **homologous** to that of mammalian PhK-.gamma. proteins but differs in the length and amino acid composition of its linker sequence. The expression of DPhK-.gamma. mRNA is developmentally regulated. We discuss the implications of these observations.

L44 ANSWER 22 OF 27 EMBASE COPYRIGHT 2002 ELSEVIER SCI. B.V.
ACCESSION NUMBER: 93347111 EMBASE
DOCUMENT NUMBER: 1993347111
TITLE: Expression and biochemical properties of a protein serine/threonine phosphatase encoded by bacteriophage .lambda..
AUTHOR: Barik S.

CORPORATE SOURCE: Department of Molecular Biology, Research Institute, Cleveland Clinic Foundation, 9500 Euclid Avenue,Cleveland, OH 44195, United States
SOURCE: Proceedings of the National Academy of Sciences of the United States of America, (1993) 90/22 (10633-10637). ISSN: 0027-8424 CODEN: PNASA6
COUNTRY: United States
DOCUMENT TYPE: Journal; Article
FILE SEGMENT: 029 Clinical Biochemistry
LANGUAGE: English
SUMMARY LANGUAGE: English

AB The predicted amino acid sequence encoded by the open reading frame 221 (orf221) of bacteriophage .lambda. exhibited a high degree of similarity to the catalytic **subunits** of a variety of protein serine/threonine phosphatases belonging to PP1, PP2A, and PP2B groups. Cloning and expression of the orf221 gene in Escherichia coli provided direct evidence that the gene codes for a protein serine/threonine phosphatase. The single-**subunit** recombinant enzyme was purified in soluble form and shown to possess a unique repertoire of biochemical properties-e.g., an absolute requirement for Mn2+, resistance to okadaic acid, inhibitors 1 and 2, and ability to dephosphorylate casein, adenovirus E1A proteins, and the .alpha. **subunit** of **phosphorylase kinase**. No phosphotyrosine phosphatase activity was observed. Mutational and biochemical analyses identified the conserved residues 73-77 and Cys138 to be important for activity. The name PP-.lambda. is proposed for this unusual prokaryotic enzyme.

L44 ANSWER 23 OF 27 EMBASE COPYRIGHT 2002 ELSEVIER SCI. B.V.
ACCESSION NUMBER: 87146298 EMBASE
DOCUMENT NUMBER: 1987146298
TITLE: Substrate specificity of **phosphorylase kinase**: Effects of heparin and calcium.
AUTHOR: Bollen M.; Kee S.M.; Graves D.J.; Soderling T.R.
CORPORATE SOURCE: Department of Molecular Physiology, Vanderbilt Medical School, Nashville, TN 37232, United States
SOURCE: Archives of Biochemistry and Biophysics, (1987) 254/2 (437-447). CODEN: ABBIA4
COUNTRY: United States
DOCUMENT TYPE: Journal
FILE SEGMENT: 037 Drug Literature Index
029 Clinical Biochemistry
LANGUAGE: English

AB Phosphorylase b and two peptides with sequences **homologous** to phosphorylation site 2 (syntide 2) and site 3 (syntide 3) of glycogen synthase were compared as substrates for purified muscle **phosphorylase kinase**. The substrate specificity of **phosphorylase kinase** varied according to whether heparin (at pH 6.5) or Ca2+ (at pH 8.2) was used as a stimulator of its activity. Phosphorylase b was preferentially phosphorylated in the presence of Ca2+, the rate of syntide 2 phosphorylation was the same for both stimulators; and the phosphorylation of syntide 3 was completely dependent on the presence of heparin. A kinetic analysis confirmed this stimulator-dependent substrate specificity since both the V(max) and K(m) for these substrates were affected diversely by heparin and Ca2+. Heparin stimulated **phosphorylase kinase** maximally at pH 6.5, whereas the effect of Ca2+ was optimal at a pH above 8. However, the stimulator-related substrate specificity could not be explained by the different pH values at which the effects of the stimulators were assessed. Nor did substrate-directed effects by heparin or Ca2+ apparently play a role. No indications were found for a stimulator-dependent specificity in the phosphorylation of sites in protein substrates of

phosphorylase kinase (**phosphorylase** b, the .alpha.- and .beta.-**subunits** of **phosphorylase kinase**, or glycogen synthase). The diverse substrate specificity of the calcium- and heparin-dependent activities of **phosphorylase kinase** could be explained in two ways: either by the existence of separate calcium- and heparin-stimulated catalytic sites, or by just one catalytic site with two active conformations. The second possibility is favored by the observation that both calcium and heparin stimulated the isolated .gamma.-**subunit** (.gamma..cntdot.calmodulin complex) of **phosphorylase kinase**.

L44 ANSWER 24 OF 27 SCISEARCH COPYRIGHT 2002 ISI (R)
ACCESSION NUMBER: 2000:114036 SCISEARCH
THE GENUINE ARTICLE: 280XA
TITLE: Specificity determinants of substrate recognition by the protein kinase DYRK1A
AUTHOR: Himpel S; Tegge W; Frank R; Leder S; Joost H G; Becker W (Reprint)
CORPORATE SOURCE: RHEIN WESTFAL TH AACHEN, FAK MED, INST PHARMAKOL & TOXIKOL, WENDLINGWEG 2, D-52057 AACHEN, GERMANY (Reprint); RHEIN WESTFAL TH AACHEN, FAK MED, INST PHARMAKOL & TOXIKOL, D-52057 AACHEN, GERMANY; AG MOL ERKENNUNG, GBF, D-38124 BRAUNSCHWEIG, GERMANY
COUNTRY OF AUTHOR: GERMANY
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (28 JAN 2000) Vol. 275, No. 4, pp. 2431-2438.
Publisher: AMER SOC BIOCHEMISTRY MOLECULAR BIOLOGY INC, 9650 ROCKVILLE PIKE, BETHESDA, MD 20814.
ISSN: 0021-9258.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE
LANGUAGE: English
REFERENCE COUNT: 61

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB DYRK1A is a dual-specificity protein kinase that is thought to be involved in brain development. We identified a single phosphorylated amino acid residue in the DYRK substrate histone H3 (threonine 45) by mass spectrometry, phosphoamino acid analysis, and protein sequencing. Exchange of threonine 45 for alanine abolished phosphorylation of histone H3 by DYRK1A and by the related kinases DYRK1B, DYRK2, and DYRK3 but not by CLK8, In order to define the consensus sequence for the substrate specificity of DYRK1A, a library of 300 peptides was designed in variation of the H3 phosphorylation site. Evaluation of the phosphate incorporation into these peptides identified DYRK1A as a proline-directed kinase with a phosphorylation consensus sequence (RPX(S/T)P) similar to that of ERK2 (PX(S/T)P). A peptide designed after the optimal substrate sequence (DYRKtide) was efficiently phosphorylated by DYRK1A (K-m = 35 mu m) but not by ERK2, Both ERK2 and DYRK1A phosphorylated myelin basic protein, whereas only ERK2, but not DYRK1A phosphorylated the mitogen-activated protein kinase substrate ELK-1, This marked difference in substrate specificity between DYRK1A and ERK2 can be explained by the requirement for an arginine at the P -3 site of DYRK substrates and its presumed interaction with aspartate 247 conserved in all DYRKs.

L44 ANSWER 25 OF 27 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1999:352557 HCAPLUS
DOCUMENT NUMBER: 131:154296
TITLE: Genomic **structure** and comparative analysis of nine Fugu genes: conservation of synteny with human chromosome Xp22.2-p22.1
AUTHOR(S): Brunner, Bodo; Todt, Tilman; Lenzner, Steffen; Stout, Karen; Schulz, Ute; Ropers, Hans-Hilger; Kalscheuer,

Vera M.
CORPORATE SOURCE: Max-Planck-Institute for Molecular Genetics, Berlin-Dahlem, D-14195, Germany
SOURCE: Genome Research (1999), 9(5), 437-448
CODEN: GEREFS; ISSN: 1088-9051
PUBLISHER: Cold Spring Harbor Laboratory Press
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The puffer-fish Fugu rubripes has a compact 400-Mb genome that is -7.5 times smaller than the human genome but contains a similar no. of genes. Focusing on the distal short arm of the human X chromosome, we have studied the evolutionary conservation of gene orders in Fugu and man. Sequencing of 68 kb of Fugu genomic DNA identified nine genes: (SCML2)-STK9, XLRS1, PPEF-1, KELCH2, KELCH1, PHKA2, AP19, and U2AFI-RS2. Apart from an evolutionary inversion sepg. AP19 and U2AFI-RS2 from PHKA2, gene orders are identical in Fugu and man, and all nine human **homologs** map to the Xp22 band. All Fugu genes were found to be smaller than their human counterparts, but gene **structures** were mostly identical. These data suggest that genomic sequencing in Fugu is a powerful and economical strategy to predict gene orders in the human genome and to elucidate the **structure** of human genes.
REFERENCE COUNT: 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L44 ANSWER 26 OF 27 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1993:642607 HCAPLUS
DOCUMENT NUMBER: 119:242607
TITLE: 2.6 Mb YAC contig of the human X inactivation center region in Xq13: Physical linkage of the RPS4X, PHKA1, XIST and DXS128E genes
AUTHOR(S): Lafreniere, Ronald G.; Brown, Carolyn J.; Rider, Sue; Chelly, Jamel; Taillon-Miller, Patricia; Chinault, A. Craig; Monaco, Anthony P.; Willard, Huntington F.
CORPORATE SOURCE: Sch. Med., Case West. Reserve Univ., Cleveland, OH, 44106, USA
SOURCE: Hum. Mol. Genet. (1993), 2(8), 1105-15
CODEN: HMGEE5; ISSN: 0964-6906
DOCUMENT TYPE: Journal
LANGUAGE: English
AB X chromosome inactivation is a mechanism of dosage compensation that regulates the expression of mammalian X-linked genes between XY males and XX females. This phenomenon is cis-acting, clonally heritable, and requires the presence of an X inactivation center (XIC). In the authors' attempts to characterize this phenomenon, the authors have focused on the phys. organization of the human XIC localized to Xq13. From previous studies, the authors had detd. that the candidate XIC interval contained two loci (DXS128 and XIST) and was bound by the breakpoints of two **structurally** abnormal inactivated X chromosomes, a t(X;14) and an idic(Xp). Here the authors present a refined mapping of the XIC-contg. region using the breakpoint of a late replicating rearranged X (rea(X)), and the initial characterization of a set of 40 yeast artificial chromosomes (YACs) derived from the XIC-contg. region. These YACs form a 2.6 Mb contig which completely covers the XIC, and phys. links the RPS4X, PHKA1, XIST, and DXS128E genes, as well as a laminin receptor pseudogene (LAMRP4). Furthermore, the authors have detd. the relative orientations of these four genes, and have derived a restriction map of the region using the rare cutter enzymes BssHII, EagI, MluI, NruI, SalI, SfiI, SstII (or SacII), and NotI. The authors have identified at least 9 CpG-rich islands within this region, and have discovered a large (.apprx.125 kb) inverted duplication proximal to the XIC based on sym. restriction patterns and **homologous** probes. The authors est. the max. size of the XIC-contg. interval to be between 680 kb and 1200 kb, based on the

localization of the breakpoints of the rearranged X chromosomes mentioned above. This lays the ground work for the further characterization of the XIC region and the isolation of other expressed sequences therefrom.

L44 ANSWER 27 OF 27 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1987:492683 HCAPLUS
DOCUMENT NUMBER: 107:92683
TITLE: Characterization of the calmodulin-binding sites of muscle phosphofructokinase and comparison with known calmodulin-binding domains
AUTHOR(S): Buschmeier, Baerbel; Meyer, Helmut E.; Mayr, Georg W.
CORPORATE SOURCE: Inst. Physiol. Chem., Ruhr-Univ., Bochum, Fed. Rep. Ger.
SOURCE: J. Biol. Chem. (1987), 262(20), 9454-62
CODEN: JBCHA3; ISSN: 0021-9258
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Calmodulin interacts with high affinity with muscle phosphofructokinase. Direct binding measurements indicated that each of the 2 **subunits** of dimeric phosphofructokinase bound 2 calmodulins with Kd (dissocn. const.) values of .apprx.3 nM and 1 .mu.M, resp., in a strictly Ca2+-dependent way. To get more detailed information about this interaction, calmodulin-binding fragments were isolated from a CNBr digest of phosphofructokinase using affinity chromatog. on calmodulin-agarose. Two fragments, M11 (mol. wt., Mr, 3080) and M22 (Mr 8060), formed a 1:1 stoichiometric complex with Ca2+-calmodulin. The amino acid sequences of these fragments were detd., and their positions in the 3-dimensional **structure**-model of phosphofructokinase are proposed. Fragment M11, which binds to calmodulin with the higher affinity (Kd 11.4 mM), is located in a region of the **subunit** where 2 dimers have been proposed to make contacts if assocg. to active tetrameric enzyme. A stabilization of the dimeric form of the enzyme by binding of calmodulin supports this location of M11. The weaker binding fragment M22 (Kd 198 nM) corresponds to the C-terminal part of the polypeptide and contains the site which is phosphorylated by cAMP-dependent protein kinase. Both fragments have **structural** properties in common with the isolated calmodulin-binding domains of myosin light chain kinase: 2 cationic segments rich in hydrophobic residues, one constantly possessing a tryptophan, and the other exhibiting an amino acid sequence resembling sites phosphorylated by cAMP-dependent protein kinase.

=> d his

(FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS, LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002

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L1          6113 S PHOSPHORYLASE (A)KINASE?
L2       1826592 S CALCIUM OR CALMODULIN
L3          1863 S L1 AND L2
L4       5404408 S CLON? OR EXPRESS? OR RECOMBINANT
L5           194 S L3 AND L4
L6       3195886 S PLANT? OR SEED?
L7        178637 S RICE OR ARYZA(A)SATIVA
L8             1 S L5 AND L7
L9             1 S L1 AND L7
                 E ALLEN S M/AU
L10          285 S E3
                 E LEE J M/AU
L11         2739 S E3
L12         3022 S L10 OR L11
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L13           0 S L1 AND L12
L14          18 S L7 AND L12
L15          17 DUP REM L14 (1 DUPLICATE REMOVED)
L16      969695 S KINASE?
L17           2 S L15 AND L16
L18           0 S L3 AND L12
L19          56 S L2 AND L12
L20           3 S L19 AND L16
L21           5 S "CALCIUM DEPENDENT PHOSPHORYLASE KINASE?"
L22           1 S L21 AND L7
L23           1 S L1 AND L7
L24           1 S L21 AND L6
L25     1725731 S SUBSTRATE? OR GLYCOGEN(A)PHOSPHORYLASE?
L26        1900 S L25 AND L1
L27           1 S L7 AND L26
L28        1789 S "CALCIUM DEPENDENT PROTEIN KINASE?"
L29          13 S L1 AND L28
L30          11 DUP REM L29 (2 DUPLICATES REMOVED)
L31        1745 S (L28 OR L1) AND SUBSTRATE?
L32         491 S L28 AND SUBSTRATE?
L33        1259 S L1 AND SUBSTRATE?
L34         203 S L32 AND PLANT?
L35          16 S L33 AND PLANT?
L36           9 DUP REM L35 (7 DUPLICATES REMOVED)
L37           1 S L36 AND L28
L38           5 S L32 AND L33
L39          13 S L1 AND L28
L40          11 DUP REM L39 (2 DUPLICATES REMOVED)
L41         210 S  L1 AND HOMOLOG?
L42          92 S L41 AND STRUCTUR?
L43          41 DUP REM L42 (51 DUPLICATES REMOVED)
L44          27 S L43 AND SUBUNIT?

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     (FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
     LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002
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L7        178637 S RICE OR ARYZA(A)SATIVA
L8             1 S L5 AND L7
L9             1 S L1 AND L7
                 E ALLEN S M/AU
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L11         2739 S E3
L12         3022 S L10 OR L11
L13            0 S L1 AND L12
L14           18 S L7 AND L12
L15           17 DUP REM L14 (1 DUPLICATE REMOVED)
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L17            2 S L15 AND L16
L18            0 S L3 AND L12
L19           56 S L2 AND L12
L20            3 S L19 AND L16
L21            5 S "CALCIUM DEPENDENT PHOSPHORYLASE KINASE?"
L22            1 S L21 AND L7
L23            1 S L1 AND L7
L24            1 S L21 AND L6
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* * * * * * * * * *   Welcome to STN International   * * * * * * * * * *

 NEWS  1          Web Page URLs for STN Seminar Schedule - N. America
 NEWS  2  Jan 25  BLAST(R) searching in REGISTRY available in STN on the Web
 NEWS  3  Jan 29  FSTA has been reloaded and moves to weekly updates
 NEWS  4  Feb 01  DKILIT now produced by FIZ Karlsruhe and has a new update
                  frequency
 NEWS  5  Feb 19  Access via Tymnet and SprintNet Eliminated Effective 3/31/02
 NEWS  6  Mar 08  Gene Names now available in BIOSIS
 NEWS  7  Mar 22  TOXLIT no longer available
 NEWS  8  Mar 22  TRCTHERMO no longer available
 NEWS  9  Mar 28  US Provisional Priorities searched with P in CA/CAplus
                  and USPATFULL
 NEWS 10  Mar 28  LIPINSKI/CALC added for property searching in REGISTRY
 NEWS 11  Apr 02  PAPERCHEM no longer available on STN.  Use PAPERCHEM2 instead.
 NEWS 12  Apr 08  "Ask CAS" for self-help around the clock
 NEWS 13  Apr 09  BEILSTEIN: Reload and Implementation of a New Subject Area
 NEWS 14  Apr 09  ZDB will be removed from STN
 NEWS 15  Apr 19  US Patent Applications available in IFICDB, IFIPAT, and IFIUDB
 NEWS 16  Apr 22  Records from IP.com available in CAPLUS, HCAPLUS, and ZCAPLUS
 NEWS 17  Apr 22  BIOSIS Gene Names now available in TOXCENTER
 NEWS 18  Apr 22  Federal Research in Progress (FEDRIP) now available

 NEWS EXPRESS  February 1 CURRENT WINDOWS VERSION IS V6.0d,
               CURRENT MACINTOSH VERSION IS V6.0a(ENG) AND V6.0Ja(JP),
               AND CURRENT DISCOVER FILE IS DATED 05 FEBRUARY 2002
 NEWS HOURS    STN Operating Hours Plus Help Desk Availability
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=> file medline embase biosis biotechds scisearch hcaplus ntis lifesci
COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                     0.42       0.42

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FILE 'LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002
COPYRIGHT (C) 2002 Cambridge Scientific Abstracts (CSA)

=> s phosphorylase (a)kinase?
L1 6113 PHOSPHORYLASE (A) KINASE?

=> s calcium or calmodulin
L2 1826592 CALCIUM OR CALMODULIN

=> s l1 and l2
L3 1863 L1 AND L2

=> s clon? or express? or recombinant
4 FILES SEARCHED...
L4 5404408 CLON? OR EXPRESS? OR RECOMBINANT

=> s l3 and l4
L5 194 L3 AND L4

=> s plant? or seed?
L6 3195886 PLANT? OR SEED?

=> s rice or aryza(a)sativa
L7 178637 RICE OR ARYZA(A) SATIVA

=> s l5 and l7
L8 1 L5 AND L7

=> d all

L8 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:523985 HCAPLUS
DN 135:118783
TI **Cloning** and sequencing of plant **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 and construction of a chimeric gene encoding the kinases
IN Allen, Stephen M.; Lee, Jian-ming
PA E. I. Du Pont De Nemours & Co., USA
SO U.S., 42 pp.
CODEN: USXXAM
DT Patent
LA English
IC ICM A01H009-00
ICS C12N009-12; C12N001-20; C07H021-04

NCL 800295000
CC 7-5 (Enzymes)
Section cross-reference(s): 3, 11
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6262345	B1	20010717	US 1999-347801	19990702
PRAI	US 1998-92438P	P	19980710		

AB This invention relates to an isolated nucleic acid fragment encoding a protein kinase. The invention also relates to the construction of a chimeric gene encoding all or a portion of the protein kinase, in sense or antisense orientation, wherein **expression** of the chimeric gene results in prodn. of altered levels of the protein kinase in a transformed host cell. **Cloning** and heterologous **expression** of **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 from corn, **rice**, soybean and wheat is disclosed. Amino acid and encoding cDNA sequences of the plant **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 are provided.

ST plant phosphorylase glycogen synthase kinase cDNA sequence; chimeric gene **calcium phosphorylase kinase** plant; gene chimeric glycogen synthase kinase 3 plant

IT Dicotyledon (Magnoliopsida)
Escherichia coli
Monocotyledon (Liliopsida)
Plant (Embryophyta)
Seed
(chimeric gene **expression** in; **cloning** and sequencing of plant **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 and construction of chimeric gene encoding kinases)

IT Gene, plant
RL: BPN (Biosynthetic preparation); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PREP (Preparation); PROC (Process)
(chimeric; **cloning** and sequencing of plant **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 and construction of chimeric gene encoding kinases)

IT Corn
Molecular **cloning**
Protein sequences
Rice (Oryza sativa)
Soybean (Glycine max)
Wheat
cDNA sequences
(**cloning** and sequencing of plant **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 and construction of chimeric gene encoding kinases)

IT Transgene
RL: BPN (Biosynthetic preparation); PRP (Properties); BIOL (Biological study); PREP (Preparation)
(**cloning** and sequencing of plant **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 and construction of chimeric gene encoding kinases)

IT Chimeric gene
RL: BPN (Biosynthetic preparation); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PREP (Preparation); PROC (Process)
(plant; **cloning** and sequencing of plant **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 and construction of chimeric gene encoding kinases)

IT 9059-09-0P, Glycogen synthase kinase

RL: BPN (Biosynthetic preparation); PRP (Properties); BIOL (Biological study); PREP (Preparation)
(3; **cloning** and sequencing of plant **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 and construction of chimeric gene encoding kinases)
IT 350630-29-4P 350630-30-7P 350630-31-8P 350630-32-9P 350630-33-0P
350630-34-1P 350630-35-2P 350630-36-3P
RL: BPN (Biosynthetic preparation); PRP (Properties); BIOL (Biological study); PREP (Preparation)
(amino acid sequence; **cloning** and sequencing of plant **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 and construction of chimeric gene encoding kinases)
IT 350630-20-5P
RL: BPN (Biosynthetic preparation); PRP (Properties); BIOL (Biological study); PREP (Preparation)
(**cloning** and sequencing of plant **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 and construction of chimeric gene encoding kinases)
IT 350630-21-6 350630-22-7 350630-23-8 350630-24-9 350630-25-0
350630-26-1 350630-27-2 350630-28-3
RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)
(nucleotide sequence; **cloning** and sequencing of plant **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 and construction of chimeric gene encoding kinases)
IT 151596-21-3 151596-23-5 156560-28-0 176025-10-8 227014-75-7
253852-95-8
RL: PRP (Properties)
(unclaimed protein sequence; **cloning** and sequencing of plant **calcium**-dependent **phosphorylase kinase** and glycogen synthase kinase-3 and construction of a chimeric gene encoding the kinases)
RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Anon; WO 9826045 1997 HCAPLUS
(2) Anon; WO 9735968 1998 HCAPLUS
(3) Anon; Plant Physiol 1997, V113, P306
(4) Bianchi; Mol Gen Genet 1994, V242(3), P337 HCAPLUS
(5) Harper, J; Science 1991, V252, P951 HCAPLUS
(6) Ncbi; Identifier No gi 1170711 1997
(7) Ncbi; Identifier No gi 1480078 1998
(8) Ncbi; Identifier No gi 1709127 1996
(9) Ncbi; Identifier No gi 1709129 1996
(10) Ncbi; Identifier No gi 3320104 1998
(11) Ncbi; Identifier No gi 3402722 1999
(12) Pay; Plant J 1993, V3(6), P847 HCAPLUS
(13) Pay; Plant, J 1993, V3(6), P847 HCAPLUS
(14) Xing-Tang; Planta 1996, V199(1), P18

=> d his

(FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS, LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002
L1 6113 S PHOSPHORYLASE (A)KINASE?
L2 1826592 S CALCIUM OR CALMODULIN
L3 1863 S L1 AND L2
L4 5404408 S CLON? OR EXPRESS? OR RECOMBINANT

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L5          194 S L3 AND L4
L6      3195886 S PLANT? OR SEED?
L7       178637 S RICE OR ARYZA(A)SATIVA
L8            1 S L5 AND L7

=> s l1 and l7
L9            1 L1 AND L7

=> d ibib

L9   ANSWER 1 OF 1  HCAPLUS  COPYRIGHT 2002 ACS
ACCESSION NUMBER:         2001:523985  HCAPLUS
DOCUMENT NUMBER:          135:118783
TITLE:                    Cloning and sequencing of plant calcium-dependent
                          phosphorylase kinase and glycogen
                          synthase kinase-3 and construction of a chimeric gene
                          encoding the kinases
INVENTOR(S):              Allen, Stephen M.; Lee, Jian-ming
PATENT ASSIGNEE(S):       E. I. Du Pont De Nemours & Co., USA
SOURCE:                   U.S., 42 pp.
                          CODEN: USXXAM
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.        KIND  DATE           APPLICATION NO.   DATE
     ---------------   ----  --------       ---------------   --------
     US 6262345         B1   20010717       US 1999-347801    19990702
PRIORITY APPLN. INFO.:                    US 1998-92438P    P 19980710
REFERENCE COUNT:          14    THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS
                                RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT


=> e allen S M/au
E1          689     ALLEN S L/AU
E2            3     ALLEN S LEE/AU
E3          285 --> ALLEN S M/AU
E4            1     ALLEN S MARK/AU
E5           25     ALLEN S N/AU
E6          164     ALLEN S P/AU
E7          187     ALLEN S R/AU
E8          110     ALLEN S S/AU
E9           60     ALLEN S T/AU
E10           1     ALLEN S T JR/AU
E11           5     ALLEN S V/AU
E12         183     ALLEN S W/AU

=> s e3
L10         285 "ALLEN S M"/AU

=> e lee j m/au
E1            1     LEE J L J/AU
E2            4     LEE J L JR/AU
E3         2739 --> LEE J M/AU
E4            3     LEE J M */AU
E5           31     LEE J M F/AU
E6            1     LEE J M G/AU
E7           21     LEE J M H/AU
E8            1     LEE J M J/AU
E9            1     LEE J M JEANETTE/AU
E10           9     LEE J M JR/AU
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E11          1     LEE J M L/AU
E12          2     LEE J M T/AU

=> s e3
L11       2739 "LEE J M"/AU

=> s l10 or l11
L12       3022 L10 OR L11

=> d his

     (FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

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L4      5404408 S CLON? OR EXPRESS? OR RECOMBINANT
L5          194 S L3 AND L4
L6      3195886 S PLANT? OR SEED?
L7       178637 S RICE OR ARYZA(A)SATIVA
L8            1 S L5 AND L7
L9            1 S L1 AND L7
                E ALLEN S M/AU
L10         285 S E3
                E LEE J M/AU
L11        2739 S E3
L12        3022 S L10 OR L11

=> s l1 and l12
L13           0 L1 AND L12

=> s l7 and l12
L14          18 L7 AND L12

=> dup rem l14
PROCESSING COMPLETED FOR L14
L15          17 DUP REM L14 (1 DUPLICATE REMOVED)

=> s kinase?
L16      969695 KINASE?

=> s l15 and l16
L17           2 L15 AND L16

=> d 1-2 ibib ab

L17   ANSWER 1 OF 2  BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT AND ISI
ACCESSION NUMBER: 2000-11818  BIOTECHDS
TITLE:            New isolated polynucleotide encoding phosphatidylinositol
                  metabolism protein is useful for producing transgenic plants
                  with an altered level of phosphatidylinositol;
                     crop improvement
AUTHOR:           Allen S M; Kinney A J; Miao G H; Rafalski J A;
                  Sakai H; Weng Z
PATENT ASSIGNEE:  Du-Pont
LOCATION:         Wilmington, DE, USA.
PATENT INFO:      WO 2000036119 22 Jun 2000
APPLICATION INFO: WO 1999-US30182 17 Dec 1999
PRIORITY INFO:    US 1998-112925 18 Dec 1998
DOCUMENT TYPE:    Patent
```

LANGUAGE: English
OTHER SOURCE: WPI: 2000-431597 [37]
AB A polynucleotide (PN) (I) encoding a plant phosphatidylinositol metabolism protein of at least 191 amino acids (aa), is claimed. (I) has at least 80% sequence identity with defined plant phosphatidylinositol-4-phosphate-**kinase** proteins of 427 and 326 aa, from maize (Zea mays) of 337 aa from **rice** (Oryza sativa) of 637, 330 or 401 aa from soybean (Glycine max). Also claimed are: a protein of at least 191 aa with at least 80% homology to phosphatidylinositol-4-phosphate-**kinase** from maize, **rice** or soybean; a PN encoding a protein of at least 116 aa with at least 80% homology to defined **rice**, maize, soybean or wheat (Triticum aestivum) sequences; a protein of at least 116 aa with 80% homology to the phosphatidylinositol-4-phosphate-**kinase** from maize, **rice** or wheat; a PN encoding a protein of at least 50 aa with 80% sequence identity to those from **rice** and wheat; a chimeric gene; a transformed host cell; a transformed virus; selecting PNs affecting level of expression of phosphatidylinositol metabolism protein in a plant cell; obtaining nucleic acid encoding a phosphatidylinositol metabolism protein; and positive selection of a transformed cell. Transgenic plants are formed. (65pp)

L17 ANSWER 2 OF 2 BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT AND ISI
ACCESSION NUMBER: 1999-03578 BIOTECHDS
TITLE: New isolated plant amino acid biosynthetic enzyme nucleic acids;
vector-mediated gene transfer and expression in transgenic plant or host cell, used for enzyme-inhibitor screening, etc.
AUTHOR: Falco S C; **Allen S M**; Thorpe C J
PATENT ASSIGNEE: Du-Pont
LOCATION: Wilmington, DE, USA.
PATENT INFO: WO 9856935 17 Dec 1998
APPLICATION INFO: WO 1998-US12073 11 Jun 1998
PRIORITY INFO: US 1997-65385 12 Nov 1997; US 1997-49406 12 Jun 1997
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: WPI: 1999-080910 [07]
AB An isolated nucleic acid fragment which encodes a plant aspartic-semialdehyde-dehydrogenase is new. The nucleic acid is selected from a nucleic acid fragment encoding all or a portion of a protein sequence of 195, 201 or 86 amino acids, a similar nucleic acid or a cDNA. Also claimed are: isolated nucleic acid fragments encoding a plant diaminopimelate-decarboxylase (EC-4.1.1.20), a plant homoserine-**kinase** (EC-2.7.1.39), a plant cysteine-synthase (EC-4.2.99.8), a maize (Zea mays) cystathionine-beta-lyase (CBL) (EC-4.4.1.8), a **rice** (Oryza sativa) CBL, a soybean (Glycine max) CBL and a wheat (Triticum aestivum) CBL; a chimeric gene containing a nucleic acid fragment of one of the above linked to regulatory sequences; a transformed host cell; and plant proteins encoded by the above nucleic acids. The enzymes are involved in the plant biosynthesis of the amino acids lysine, threonine, methionine, cysteine and isoleucine from aspartate. The nucleic acids can be used for altering the level of expression of transgenic plant amino acid biosynthesis enzymes and to evaluate compounds for their enzyme inhibition activity. (79pp)

=> d his

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FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,

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L11         2739 S E3
L12         3022 S L10 OR L11
L13            0 S L1 AND L12
L14           18 S L7 AND L12
L15           17 DUP REM L14 (1 DUPLICATE REMOVED)
L16       969695 S KINASE?
L17            2 S L15 AND L16

=> s l3 and l12
L18            0 L3 AND L12

=> s l2 and l12
L19           56 L2 AND L12

=> s l19 and l16
L20            3 L19 AND L16

=> d 1-3 ibib ab

L20  ANSWER 1 OF 3     MEDLINE
ACCESSION NUMBER:    96322950     MEDLINE
DOCUMENT NUMBER:     96322950   PubMed ID: 8759782
TITLE:               Reduction of calcineurin enzymatic activity in Alzheimer's
                     disease: correlation with neuropathologic changes.
AUTHOR:              Ladner C J; Czech J; Maurice J; Lorens S A; Lee J M
CORPORATE SOURCE:    Department of Pharmacology, Stritch School of Medicine,
                     Loyola University, Maywood (Chicago), IL 60153, USA.
CONTRACT NUMBER:     1F31MH11212 (NIMH)
SOURCE:              JOURNAL OF NEUROPATHOLOGY AND EXPERIMENTAL NEUROLOGY, (1996
                     Aug) 55 (8) 924-31.
                     Journal code: JBR; 2985192R. ISSN: 0022-3069.
PUB. COUNTRY:        United States
                     Journal; Article; (JOURNAL ARTICLE)
LANGUAGE:            English
FILE SEGMENT:        Priority Journals
ENTRY MONTH:         199612
ENTRY DATE:          Entered STN: 19970128
                     Last Updated on STN: 19980206
                     Entered Medline: 19961205
AB   Neurofibrillary tangles (NFT), neuritic plaques, and dystrophic neurites
     are the classic neuropathologic hallmarks of Alzheimer's disease (AD), all
     of which contain to varying degrees abnormally and/or hyperphosphorylated
     forms of the microtubule-associated protein tau. Protein phosphatase 2B
     (calcineurin) dephosphorylates tau isolated from AD brains to control
     levels in vitro as well as regulates tau phosphorylation and function in
     vivo. It has been hypothesized that the changes in tau phosphorylation
     observed in AD may be due to increases in kinase activity and/or
     decreases in phosphatase activity. In order to investigate the latter
     possibility, we examined calcineurin enzyme activity using the substrate
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para-nitrophenyl-phosphate (pNPP) in postmortem brain samples from individuals with moderate to severe AD (n = 8) and age-matched controls (n = 7). The stimulation of calcineurin activity by manganese chloride (1 mM) was reduced by 60% ($p < 0.01$) in whole-cell homogenates prepared from AD temporal cortex (Brodmann area 38). On the other hand, in P2 membrane fractions, the stimulation of calcineurin activity by manganese chloride as well as nickel chloride (1 mM) was reduced by 37% ($p < 0.05$) and 79% ($p < 0.01$), respectively. The manganese-stimulated calcineurin activity in the temporal cortex inversely correlated with both the number of NFT ($r = -0.60$, $p < 0.02$) and neuritic/core plaques ($r = -0.63$, $p < 0.02$) in whole-cell homogenates, but only with NFT ($r = -0.61$, $p < 0.02$) in P2 membrane fractions. The nickel-stimulated calcineurin activity did not correlate with neuropathology measures in either whole-cell or P2 membrane fractions. In striate visual cortex (Brodmann area 17), an area relatively unaffected in AD, neither whole-cell nor P2 membrane calcineurin activity were significantly altered. To our knowledge, this is the first report of a reduction in calcineurin phosphatase activity in AD which correlates with the neuropathological features in a region-, subcellular fraction-, and divalent cation-specific manner.

L20 ANSWER 2 OF 3 SCISEARCH COPYRIGHT 2002 ISI (R)
ACCESSION NUMBER: 2001:81049 SCISEARCH
THE GENUINE ARTICLE: 392VH
TITLE: Selective changes of calcineurin (protein phosphatase 2B) activity in Alzheimer's disease cerebral cortex
AUTHOR: Lian Q Y (Reprint); Ladner C J; Magnuson D; **Lee J M**
CORPORATE SOURCE: Loyola Univ, Neurosci Program, Maywood, IL 60153 USA (Reprint); Loyola Univ, Dept Pathol & Pharmacol, Maywood, IL 60153 USA
COUNTRY OF AUTHOR: USA
SOURCE: EXPERIMENTAL NEUROLOGY, (JAN 2001) Vol. 167, No. 1, pp. 158-165.
Publisher: ACADEMIC PRESS INC, 525 B ST, STE 1900, SAN DIEGO, CA 92101-4495 USA.
ISSN: 0014-4886.
DOCUMENT TYPE: Article; Journal
LANGUAGE: English
REFERENCE COUNT: 40

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Neurofibrillary tangles, which contain abnormally hyperphosphorylated forms of tau protein, are one of the neuropathological hallmarks of Alzheimer's disease (AD). This altered phosphorylation state of tau protein may be due to increased **kinase** activity or/and decreased phosphatase activity. In the present study, we characterized human calcineurin phosphatase activity in postmortem superior frontal cortex and sensorimotor cortex and measured calcineurin phosphatase activity in samples from individuals with moderate to severe AD (n = 7) and age-matched controls (n = 5). Basal phosphatase activity was reduced by 25% ($P < 0.05$) in AD frontal cortex. Nickel-stimulated calcineurin activity was decreased by 52% ($P < 0.05$) and 30% ($P < 0.05$) in P2 and total cell homogenate, respectively, compared to age matched controls. No differences in phosphatase activities were detected in the sensorimotor cortex. The decrease in nickel-stimulated calcineurin phosphatase activity in frontal lobe correlated with the neurofibrillary tangle pathology (total cell homogenate, $r = -0.77$, $P < 0.05$; P2 fraction, $r = -0.76$, $P < 0.02$), but not with diffuse or neuritic plaques. Despite the changes in calcineurin phosphatase activity in the superior frontal cortex, calcineurin protein levels determined by immunoblot were similar in control and AD cases. In addition, no changes in calcineurin regulatory proteins (cyclophilin A and FKBP12) levels were observed. These studies suggest that decrease of calcineurin activity may play a role in

paired-helical filament formation and/or stabilization, and the decrease of activity was not accompanied by a decrease of calcineurin protein expression. (C) 2001 Academic Press.

L20 ANSWER 3 OF 3 SCISEARCH COPYRIGHT 2002 ISI (R)
ACCESSION NUMBER: 96:588532 SCISEARCH
THE GENUINE ARTICLE: VA570
TITLE: REDUCTION OF CALCINEURIN ENZYMATIC-ACTIVITY IN ALZHEIMERS-DISEASE - CORRELATION WITH NEUROPATHOLOGIC CHANGES
AUTHOR: LADNER C J; CZECH J; MAURICE J; LORENS S A; **LEE J M (Reprint)**
CORPORATE SOURCE: LOYOLA UNIV, MED CTR, STRITCH SCH MED, DEPT PATHOL, SECT NEUROPATHOL, BLDG 110, 2160 S 1ST AVE, MAYWOOD, IL, 60153 (Reprint); LOYOLA UNIV, MED CTR, STRITCH SCH MED, DEPT PATHOL, SECT NEUROPATHOL, MAYWOOD, IL, 60153; LOYOLA UNIV, STRITCH SCH MED, DEPT PHARMACOL, MAYWOOD, IL, 60153
COUNTRY OF AUTHOR: USA
SOURCE: JOURNAL OF NEUROPATHOLOGY AND EXPERIMENTAL NEUROLOGY, (AUG 1996) Vol. 55, No. 8, pp. 924-931.
ISSN: 0022-3069.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE
LANGUAGE: ENGLISH
REFERENCE COUNT: 52

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Neurofibrillary tangles (NFT), neuritic plaques, and dystrophic neurites are the classic neuropathologic hallmarks of Alzheimer's disease (AD), all of which contain to varying degrees abnormally and/or hyperphosphorylated forms of the microtubule-associated protein tau. Protein phosphatase 2B (calcineurin) dephosphorylates tau isolated from AD-brains to control levels in vitro as well as regulates tau phosphorylation and function in vivo. It has been hypothesized that the changes in tau phosphorylation observed in AD may be due to increases in **kinase** activity and/or decreases in phosphatase activity. In order to investigate the latter possibility, we examined calcineurin enzyme activity using the substrate para-nitrophenylphosphate (pNPP) in postmortem brain samples from individuals with moderate to severe AD (n=8) and age-matched controls (n=7). The stimulation of calcineurin activity by manganese chloride (1 mM) was reduced by 60% ($p<0.01$) in whole-cell homogenates prepared from AD temporal cortex (Brodmann area 38). On the other hand, in P2 membrane fractions, the stimulation of calcineurin activity by manganese chloride as well as nickel chloride (1 mM) was reduced by 37% ($p<0.05$) and 79% ($p<0.01$), respectively. The manganese stimulated calcineurin activity in the temporal cortex inversely correlated with both the number of NFT ($r=-0.60$, $p<0.02$) and neuritic/core plaques ($r=-0.63$, $p<0.02$) in whole-cell homogenates, but only with NFT ($r=-0.61$, $p<0.02$) in P2 membrane fractions. The nickel-stimulated calcineurin activity did not correlate with neuropathology measures in either whole-cell or P2 membrane fractions. In striate visual cortex (Brodmann area 17), an area relatively unaffected in AD, neither whole-cell nor P2 membrane calcineurin activity were significantly altered. To our knowledge, this is the first report of a reduction in calcineurin phosphatase activity in AD which correlates with the neuropathological features in a region-, subcellular fraction-, and divalent cation-specific manner.

=> d his

(FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

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     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
     LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002
L1          6113 S PHOSPHORYLASE (A)KINASE?
L2       1826592 S CALCIUM OR CALMODULIN
L3          1863 S L1 AND L2
L4       5404408 S CLON? OR EXPRESS? OR RECOMBINANT
L5           194 S L3 AND L4
L6       3195886 S PLANT? OR SEED?
L7        178637 S RICE OR ARYZA(A)SATIVA
L8             1 S L5 AND L7
L9             1 S L1 AND L7
                 E ALLEN S M/AU
L10          285 S E3
                 E LEE J M/AU
L11         2739 S E3
L12         3022 S L10 OR L11
L13            0 S L1 AND L12
L14           18 S L7 AND L12
L15           17 DUP REM L14 (1 DUPLICATE REMOVED)
L16       969695 S KINASE?
L17            2 S L15 AND L16
L18            0 S L3 AND L12
L19           56 S L2 AND L12
L20            3 S L19 AND L16

=> s "calcium dependent phosphorylase kinase?"
L21            5 "CALCIUM DEPENDENT PHOSPHORYLASE KINASE?"

=> d 1-5 ibib ab

L21  ANSWER 1 OF 5     MEDLINE
ACCESSION NUMBER:    84023668     MEDLINE
DOCUMENT NUMBER:     84023668   PubMed ID: 6626146
TITLE:               The phosphorylase kinase activity of hearts from
                     phosphorylase kinase-deficient mice.
AUTHOR:              Gross S R; Connor J J; Johnson R M
CONTRACT NUMBER:     GM26153 (NIGMS)
SOURCE:              BIOCHEMICAL GENETICS, (1983 Aug) 21 (7-8) 781-6.
                     Journal code: 9YK; 0126611. ISSN: 0006-2928.
PUB. COUNTRY:        United States
                     Journal; Article; (JOURNAL ARTICLE)
LANGUAGE:            English
FILE SEGMENT:        Priority Journals
ENTRY MONTH:         198311
ENTRY DATE:          Entered STN: 19900319
                     Last Updated on STN: 19970203
                     Entered Medline: 19831123
AB   In an assay measuring radioactive incorporation from gamma--P32P]ATP into
     phosphorylase b, cardiac muscle extracts from mice with the phosphorylase
     kinase deficiency mutation showed significant, calcium-
     dependent phosphorylase kinase activity that
     was 10 to 15% of that of Swiss mice, the control strain. Isoproterenol
     stimulated significant phosphorylase a accumulation in both isolated atria
     and right ventricular strips of phosphorylase kinase-deficient mice, and
     the drug-stimulated increases in phosphorylase a activity the the
     contractile responses of right ventricular strips were similar in Swiss
     and phosphorylase kinase/deficient mice.

L21  ANSWER 2 OF 5  BIOSIS  COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER:    1983:76959  BIOSIS
DOCUMENT NUMBER:     BR25:1959
TITLE:               INHIBITION OF PROTEIN KINASE CATALYZED PHOSPHORYLATION
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PROCESSES BY LIGANDS.
AUTHOR(S): ERDODI F; GERGELY P; BOT G
CORPORATE SOURCE: INST. MED. CHEMISTRY, UNIV. MED. SCH., DEBRECEN, BEM TER 18/B, H-4026, HUNGARY.
SOURCE: PROCEEDINGS OF THE 21ST HUNGARIAN ANNUAL MEETING FOR BIOCHEMISTRY, VESZPREM, HUNGARY, AUG. 24-27, 1981. PROC HUNG ANNU MEET BIOCHEM, (1981 (RECD 1982)) 21 (0), 103-104. CODEN: PHABDI. ISSN: 0134-0689.
FILE SEGMENT: BR; OLD
LANGUAGE: English

L21 ANSWER 3 OF 5 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 2001:523985 HCAPLUS
DOCUMENT NUMBER: 135:118783
TITLE: Cloning and sequencing of plant **calcium-dependent phosphorylase kinase** and glycogen synthase kinase-3 and construction of a chimeric gene encoding the kinases
INVENTOR(S): Allen, Stephen M.; Lee, Jian-ming
PATENT ASSIGNEE(S): E. I. Du Pont De Nemours & Co., USA
SOURCE: U.S., 42 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6262345	B1	20010717	US 1999-347801	19990702

PRIORITY APPLN. INFO.: US 1998-92438P P 19980710
AB This invention relates to an isolated nucleic acid fragment encoding a protein kinase. The invention also relates to the construction of a chimeric gene encoding all or a portion of the protein kinase, in sense or antisense orientation, wherein expression of the chimeric gene results in prodn. of altered levels of the protein kinase in a transformed host cell. Cloning and heterologous expression of **calcium-dependent phosphorylase kinase** and glycogen synthase kinase-3 from corn, rice, soybean and wheat is disclosed. Amino acid and encoding cDNA sequences of the plant **calcium-dependent phosphorylase kinase** and glycogen synthase kinase-3 are provided.
REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1981:26793 HCAPLUS
DOCUMENT NUMBER: 94:26793
TITLE: Calcium-dependent adsorption and desorption of phosphorylase kinase on membrane fractions of sarcoplasmic reticulum
AUTHOR(S): Jennissen, Herbert P.; Lahr, Peter
CORPORATE SOURCE: Inst. Physiol. Chem., Ruhr-Univ. Bochum, Bochum, D-4630/1, Fed. Rep. Ger.
SOURCE: FEBS Lett. (1980), 121(1), 143-8
CODEN: FEBLAL; ISSN: 0014-5793
DOCUMENT TYPE: Journal
LANGUAGE: English
AB In the presence of 10 nM free Ca2+, only 7% of exogenously added purified phosphorylase kinase (I) eluted together with Ca2+-transport ATPase activity and sarcoplasmic reticulum (SR) protein when mixts. of I and crude SR vesicles were subjected to gel filtration. However, in the

presence of .apprx.10 .mu.M Ca2+, >50% of exogenous I eluted complexed to SR vesicles. SDS-polyacrylamide gel electrophoresis showed that intact subunits of I are detectable in the I-SR complex obtained at 10 .mu.M Ca2+ and that the molar ratio of .alpha..alpha.'/.beta. in the complex was similar to that prior to incubation of I with SR. At 10 nM free Ca2+, .ltoreq.30% of adsorbed I can be desorbed from SR vesicles, whereas only 7% of the adsorbed activity was released at 10 .mu.M Ca2+. The activity ratio of I did not change significantly during adsorption at 10 nM Ca2+, whereas at 10 .mu.M Ca2+ the activity of adsorbed I increased .apprx.2-fold compared to sol. I. Both adsorbed and sol. I were inhibited .apprx.97% by anti-I antibodies. Expts. with trypsin- and .alpha.-amylase-digested SR vesicles showed that adsorption was dependent on protein and glycogen components of SR vesicles.

L21 ANSWER 5 OF 5 HCAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1979:519401 HCAPLUS
DOCUMENT NUMBER: 91:119401
TITLE: Calcium-dependent phosphorylation of glycogen synthase by phosphorylase kinase
AUTHOR(S): Walsh, Kenneth X.; Millikin, Dina M.; Schlender, Keith K.; Reimann, Erwin M.
CORPORATE SOURCE: Dep. Biochem., Med. Coll. Ohio, Toledo, OH, 43699, USA
SOURCE: J. Biol. Chem. (1979), 254(14), 6611-16
CODEN: JBCHA3; ISSN: 0021-9258
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Purified prepns. of rabbit skeletal muscle glycogen synthase (I) (sp. activity 6-42 units/mg protein) were found to be contaminated with Ca2+-dependent kinase(s) which catalyzed the phosphorylation of phosphorylase b (II) and I. In a series of I prepns. there was a correlation between the phosphorylatin rates of I and of added II. Both reactions were stimulated by Ca2+ and, to varying degree, by the Ca2+-dependent regulatory protein in the presence of Ca2+. When .apprx.0.5 mol of phosphate was introduced per mol I subunit, there was a small decrease in I activity measured in the absence of glucose 6-phosphate. II inhibited the inactivation of I and purified phosphorylase kinase (III) increased the rates of phosphorylation of I. DEAE-cellulose chromatog. of purified III failed to sep. Ca2+-dependent glycogen synthase kinase and III activities. Activation of III by cyclic AMP-dependent protein kinase increased the rate of phosphorylation of both I and II. For nonactivated III and for III activated by cyclic AMP-dependent protein kinase, the rate of I phosphorylation was .apprx.1/5 the rate of II phosphorylation. Apparently, I is a potential substrate for III in vivo.

=> d his

(FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS, LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002

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L1          6113 S PHOSPHORYLASE (A)KINASE?
L2       1826592 S CALCIUM OR CALMODULIN
L3          1863 S L1 AND L2
L4       5404408 S CLON? OR EXPRESS? OR RECOMBINANT
L5           194 S L3 AND L4
L6       3195886 S PLANT? OR SEED?
L7        178637 S RICE OR ARYZA(A)SATIVA
L8             1 S L5 AND L7
L9             1 S L1 AND L7
                 E ALLEN S M/AU
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L10         285 S E3
                E LEE J M/AU
L11        2739 S E3
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L15          17 DUP REM L14 (1 DUPLICATE REMOVED)
L16      969695 S KINASE?
L17           2 S L15 AND L16
L18           0 S L3 AND L12
L19          56 S L2 AND L12
L20           3 S L19 AND L16
L21           5 S "CALCIUM DEPENDENT PHOSPHORYLASE KINASE?"

=> s l21 and l7
L22           1 L21 AND L7

=> d ibib

L22  ANSWER 1 OF 1  HCAPLUS  COPYRIGHT 2002 ACS
ACCESSION NUMBER:         2001:523985  HCAPLUS
DOCUMENT NUMBER:          135:118783
TITLE:                    Cloning and sequencing of plant calcium-
                          dependent phosphorylase
                          kinase and glycogen synthase kinase-3 and
                          construction of a chimeric gene encoding the kinases
INVENTOR(S):              Allen, Stephen M.; Lee, Jian-ming
PATENT ASSIGNEE(S):       E. I. Du Pont De Nemours & Co., USA
SOURCE:                   U.S., 42 pp.
                          CODEN: USXXAM
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.        KIND  DATE           APPLICATION NO.  DATE
     ---------------   ----  --------       ---------------  --------
     US 6262345         B1   20010717       US 1999-347801   19990702
PRIORITY APPLN. INFO.:                     US 1998-92438P   P  19980710
REFERENCE COUNT:          14    THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS
                                RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT


=> d his

     (FILE 'HOME' ENTERED AT 14:31:39 ON 07 MAY 2002)

     FILE 'MEDLINE, EMBASE, BIOSIS, BIOTECHDS, SCISEARCH, HCAPLUS, NTIS,
     LIFESCI' ENTERED AT 14:32:31 ON 07 MAY 2002
L1          6113 S PHOSPHORYLASE (A)KINASE?
L2       1826592 S CALCIUM OR CALMODULIN
L3          1863 S L1 AND L2
L4       5404408 S CLON? OR EXPRESS? OR RECOMBINANT
L5           194 S L3 AND L4
L6       3195886 S PLANT? OR SEED?
L7        178637 S RICE OR ARYZA(A)SATIVA
L8             1 S L5 AND L7
L9             1 S L1 AND L7
                 E ALLEN S M/AU
L10          285 S E3
                 E LEE J M/AU
L11         2739 S E3
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L12         3022 S L10 OR L11
L13            0 S L1 AND L12
L14           18 S L7 AND L12
L15           17 DUP REM L14 (1 DUPLICATE REMOVED)
L16       969695 S KINASE?
L17            2 S L15 AND L16
L18            0 S L3 AND L12
L19           56 S L2 AND L12
L20            3 S L19 AND L16
L21            5 S "CALCIUM DEPENDENT PHOSPHORYLASE KINASE?"
L22            1 S L21 AND L7

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	Document ID △	Issue Date	Pages
1	US 20010051184 A1	20011213	59
2	US 6017734 A	20000125	105

	Document ID △	Issue Date	Pages	Title
1	US 20010051184 A1	20011213	59	METHOD FOR USING SOLUBLE CURCUMIN TO INHIBIT PHOSPHORYLASE KINASE IN INFLAMMATORY DISEASES
2	US 20020009797 A1	20020124	24	Growth stimulation of biological cells and tissue by electromagnetic fields and uses thereof
3	US 5925376 A	19990720	30	Method for treating psoriasis using selected phosphorylase kinase inhibitor and additional compounds
4	US 6010858 A	20000104	5	Method for expression cloning of gene encoding protein kinase substrate protein
5	US 6017734 A	20000125	105	Unique nucleotide and amino acid sequence and uses thereof
6	US 6262345 B1	20010717	42	Plant protein kinases
7	US 6368856 B1	20020409	49	Antisense inhibition of Phosphorylase kinase beta expression

	L #	Hits	Search Text
1	L1	150	phosphorylase adj kinase$3
2	L2	41388	rice or (oryza adj sativa)
3	L3	2	l1 same l2
4	L4	421527	clon$3 or express$3 or recombinant
5	L5	44	l1 same l4
6	L6	257497	plant$2 or seed$2
7	L7	2	l5 same l6
8	L8	225272	calcium or calmodulin
9	L9	7	l5 same l8
10	L10	13434	allen.in.
11	L11	1	l1 and l10
12	L12	31306	lee.in.

	L #	Hits	Search Text
13	L13	2	l1 and l12

	Document ID △	Issue Date	Pages	Title
1	US 6017734 A	20000125	105	Unique nucleotide and amino acid sequence and uses thereof
2	US 6262345 B1	20010717	42	Plant protein kinases

6368856